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AN ARCHIPELAGO OF SAND DUNES IN A LAKE OF
CENTRAL ASIA.

BY

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The continent of Asia is singularly deficient in lakes of the so-called normal type—bodies of fresh water like Lake Superior, having outlets to the sea or to some other lake, and occupying *grabens* or depressions due to movements of the earth's crust. Lake Baikal is the only large body of water of this sort. Three other fresh water lakes of moderate size lie like Baikal in grabens in the plateaux which form the backbone of Asia, but none of these drain to the sea, and all possess peculiar characteristics. The Armenian lake, Gokcha, nearly fifty miles long, is almost normal, having an outlet to the Caspian Sea much of the time. In dry periods, however, it often fails to overflow for several years. Another lake, Issik Kul, in the Tian Shan region, 115 miles long, appears on the map to have an outlet leading northwest into the desert toward the Sea of Aral. As a matter of fact the apparent outlet is really an inlet. The Chu river, the largest stream of the region, flows northward almost to the western end of Issik Kul, and there divides. One branch flows eastward into the lake, and the other northwestward to be lost in the desert. The divided stream presents the appearance of an outlet on the map, and in times of unusually high water actually serves as such. The third lake, Bagrash Kul, 55 miles long, forms the subject of the present article. Like Lakes Gokcha and Issik Kul, it has sometimes overflowed and sometimes failed to do so. At present it appears to have discharged through the Konche river to the swampy salt lake of Lop-Nor for a long term of years.

Bagrash Kul is situated not far from the centre of Asia in the

latitude of Chicago, and about as far east of Greenwich as the American city is west of that point. It lies in a graben at an elevation of about 3,000 feet above the sea and about 9,000 feet below the broad uplands and swelling ranges of the Tian Shan plateau. The plateau, here at its eastern end, breaks up, as it were, into several eastward-pointing fingers between which lie the deep depressions of Bagrash Kul, and Turfan. East and west the graben of Bagrash Kul extends about seventy-five miles, and north and south over fifty. Westward it narrows gradually to the valley of the Khaidik Gol river, the main affluent of the lake. On the north and south it appears to be bounded by faults of comparatively recent date. This is proved by physiographic rather than stratigraphic evidence, for the stratigraphy has never been studied. On the south the finger of Tian Shan, which there hems in the graben, is seen from below to be comparatively flat-topped, and the natives describe it as like the more western parts of the plateau, a region of broad plains and gently-sloping mountains of mature topography, the summer home of a few truculent Mongol nomads. It is bordered by a very steep escarpment, cut into enormous buttresses by deep narrow cañons. The foot of the escarpment is comparatively straight, without projecting spurs or deeply reentrant fans of gravel. The valleys are narrow clear to the point where they suddenly debouch upon the open floor of the graben. On the north much the same condition prevails. Here, however, in the neighborhood of Ushak Tal it can be seen that the inferred fault line at the base of the escarpment cuts diagonally across the strata of the mountains, a conformation which almost certainly indicates faulting. Eastward the graben has no distinct boundary, but merges imperceptibly into the so-called Kuruk Tagh, or Dry Mountains, a region of intense aridity characterized by vast deposits of gravel half burying maturely dissected mountains, and coming to an end in the broad salt plains of ancient lakes now extinct. Apparently, this eastern region, with its gentle slopes and its abundant evidences of prolonged erosion under nearly the same conditions as those now prevailing, represents the state of the Tian Shan plateau before it was uplifted.

Young fault scarps are found, not only at Bagrash Kul, but at Turfan, a hundred miles to the northeast, Issik Kul, four hundred miles to the west, the Lop basin, three hundred miles to the south, and apparently in other parts of Central Asia. In every case the faults are associated with broadly uplifted regions of mature topography. It seems safe to infer that the prevalent form of mountain-building in recent times throughout a large part of the great central

mountain masses of Asia has been by the uplift of extensive plateaux, bounded in many cases by faults and elsewhere by flexures, and broken often by grabens.

Coming to the floor of the graben of Bagrash Kul, we find that on every side it is bordered for a space of from five to twenty miles by the piedmont gravel slopes, which form such a characteristic feature of all arid mountain regions. At the base of the escarpments the gravel is coarse and bears but little vegetation, partly because the rainfall is scanty, and partly because water sinks into the gravel very rapidly. Farther out from the mountains the gravel gives place to sand and silt and the amount of vegetation increases. On the west, where the Khaidik Gol river brings down a great amount of waste, a large fan or delta of fine material has been built, pushing the lake far to the east, and dividing it into two distinct arms. Most of the population of the region gathers on the delta, for here there is the greatest amount of water for the irrigation, without which no crops can be raised. On the river lies the town of Kara Sher, with about 5,000 inhabitants, partly Chantos of Aryan race, Turkish speech, and Mohammedan faith, and partly Dungans, or Mohammedan Chinese. Around the city there are numerous villages, which appear as groups of trees towering above mud walls in the midst of fertile grain fields. At a distance from the river, where no water can be procured for irrigation, the plain is covered with a fine growth of tall pampas grass, rising occasionally above the head of a rider on horseback, and giving to the region an appearance of habitability rare in the dry inner parts of Asia. Here and there in the midst of the tall grass one spies groups of the round, gray felt tents of Mongol nomads, who feed their flocks and herds on the delta in winter and go to the grassy uplands of the plateau in summer. They get water during the winter from wells, which can easily be sunk in the soft silt of the delta.

A glance at the map of the lake shows that its shore-line is very irregular, as though the coast had been drowned. This is especially noticeable at the eastern end, where numerous promontories and islands and deep bays present an appearance not unlike that of the coast of Maine or Norway. As one approaches the eastern end of the lake from the south, he finds four zones between the fault scarp at the base of the plateau and the edge of the water. First, on the outside there are the piedmont gravels streaming down from the mountains on every hand; then comes a somewhat saline belt of fine yellow silt, only a mile or so wide on the south, but stretching six or seven miles east of the lake, and there becoming so saline that edible

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salt is collected from it for use at Kara Sher; third, there is a belt of great sand dunes, trending north-northeast with the steeper slope to the east, tawny yellow in the main, but dark gray on the outer edges, where sand has been blown in from the gravel; and fourth, the lake is bordered by a belt of thick, tall reeds ending suddenly at the water's edge in a perpendicular bank rising three to six inches high above the surface and descending three or four feet below it. The dunes appear to be stationary in their lower parts, for up to a height of 100 feet or more they bear a peculiar kind of grass found most frequently in dry lake-beds. In addition to the grass there are other small weeds and bushes which appear to have sprung up since the sand ceased to move. The upper parts of the dunes are free from vegetation, and seem to move this way and that with the wind. Although, as said above, the main declivity is to the east, indicating that the strongest winds are from the west, yet in February, 1906, the upper parts of the dunes had been blown back so that the steepest slope for ten or twelve feet was toward the west, suggesting that recent winds had been strong from the east. In many places dead vegetation is found well above the limit of present growth, which may be due to the recent change of climate, of which there is evidence in the ruins found on the north side of Bagrash Kul. The dunes are limited to the eastern end of the lake, where they form a belt from three to five miles wide, extending thirty or more miles along the south shore, and half as far on the east shore. They are highest ten or twenty miles from the eastern end, where, close to the south shore, the writer climbed one having a height of 550 feet, a small mountain of pure sand.

The most remarkable feature of the sand dunes is that some of them stand directly in the water as islands, while others form great promontories. The scenery is in the highest degree unique. Climbing to the top of a giant sand dune, one finds himself on an island of tawny sand a mile or two long and half a mile wide. Round about there is a fringe of dull brown reeds, while outside the reeds, as the scene was in February, there lies a white expanse of ice covered with an inch or two of snow. Lakeward only the ice and snow are visible. Landward narrow gulfs stretch inland for two or three miles, twisting this way and that among hilly islands or between high promontories of soft sand. Here and there one sees islands in the lake, or, in the other direction, sheets of water apparently completely surrounded by sand. In many places the lowland between the mountains of sand is covered with miles of reed beds. In spring, when the reeds begin to sprout and the lake is free from ice, the

scenery must be wonderful. A lake of the deepest blue then borders strips of vivid green, within which the paler, gray-green vegetation of the base of the dunes gradually shades into the pale reddish yellow of lofty sand hills, while far away beyond the shimmering white of the salt plains and the monotonous gray of the zone of piedmont gravel, pale blue mountains rise capped with glistening snow.

Hedin, following Roborowski, believes that this archipelago of sand dunes accumulated when the lake stood at its present level. He supposes that the sand was blown across the water. This appears to be impossible. In the first place, several of the largest dunes are complete islands, separated from the main land by an open channel 1,000 feet wide, and by reed beds two or three miles wide. The huge quantities of sand in the islands could hardly have crossed such areas without building up the reed beds into dunes. In the channels the depth of water is considerable. In one case half a mile in from the mouth of one of the large bays, and 500 feet from the shore of one of the larger islands, the writer chopped through 21 inches of ice, and found the depth of the water to be 29 feet 9 inches. This shows that even at low water there can be no very complete connection between the mainland and this particular dune. The depth of the lake as a whole is not known. At the narrowest point southeast of the tip of the Khaidik Gol delta a depth of 34 feet 9 inches was found about half way from shore to shore.

Another line of reasoning shows more conclusively that the sand was not blown to the islands while they were surrounded by water. The prevalence of the steepest slope of the dunes on the east or southeast side indicates almost beyond question that the sand came from the north and west. That is, it came across what is now the bed of the lake. It certainly could not have done so if the lake bed were covered with water, as it now is. Therefore, we must conclude that at some former time the lake was dry for a long period, during which its bed was subjected to æolian erosion, and great deposits of sand were piled up along the eastern and southern shores.

In endeavoring to find the cause of the laying bare of the lake bed, one of the first suggestions is that Bagrash Kul, like Issik Kul, may have been tilted so that the water was poured from the western end into the eastern end, drowning the valleys and giving the magnificent scenery there found. This is negatived, however, by the fact that the western shores are not smooth like those of Issik Kul, as befit an uplifted portion of a lake bed, but are sinuous, as if they, too, had been drowned. Moreover, it would require a very great amount of tipping to remove the water sufficiently to

allow the wind to gather the mass of sand found in the dunes. Another suggestion is that the lake may have diminished in size during some of the interglacial epochs of which there is evidence among the moraines of Tian Shan. It is probable that the climate was drier at such times, and this may have been a contributory cause of the accumulation of sand, but it is not probable that the climate was so extraordinarily dry as to cause the almost complete disappearance of the lake. It is more likely that the drying up of Bagrash Kul was due to the diversion of the Khaidik Gol river, so that, without emptying into the lake, it flowed directly to the gorge at Korla, by which the Konche river now carries the waters of Bagrash through the southern finger of the Tian Shan plateau. Travellers report an old channel running in this direction. The Chu river, as we have seen, does practically the same thing at present. Most of its water flows off through a gorge in the mountains northwest of Issik Kul without entering the lake. In Seyistan, in eastern Persia, the Helmund river is known to have done likewise some centuries ago, flowing to the God-i-Zirrah instead of to the Hamuni-Seyistan, as it now does. Apparently, in arid regions, where rivers build up fans with great rapidity, it is no uncommon thing for the main tributary of a lake to be diverted. Changes in the course of streams would be especially likely to happen in times of extreme aridity like interglacial epochs. At the beginning of such epochs the rivers would be very heavily loaded with waste, because the gradual death of vegetation on the mountain sides, as the climate became drier, would allow the rock mantle to be quickly stripped off. Accordingly, fans would accumulate rapidly, and the rivers would be forced to take new courses.

It is probable that the deflection of the Khaidik Gol took place during an epoch of great aridity, for otherwise the lake-bed would have been covered with vegetation, and the winds would have had no opportunity to accumulate large amounts of sand. The period or periods during which the lake was dry must have been prolonged, for dunes over 500 feet high cannot be formed in a short time. Nevertheless, the river must have flowed into the lake for even longer periods, for otherwise it could not have formed so large a delta. Lake Bagrash Kul, with its drowned archipelago of sand dunes and its deflected river, furnishes a good illustration of the number and variety of the vicissitudes to which even a so-called normal lake is subject in an arid climate.

SOME PROBLEMS OF THE TROPICS.*

BY

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GENERAL: THE DEVELOPMENT OF THE TROPICS.—Within the tropics, under the equatorial sun, and where there is abundance of moisture, animal and plant life reach their fullest development. Here are the lands which are the most valuable to the white man because of the wealth of their products. Here are the tropical "spheres of influence" or "colonies" which are among his most coveted possessions. It is in this belt that food is provided for man throughout the year without labor on his part; in which frost and drought need not be feared; where shelter and clothing are so easily provided and often so unnecessary, that life becomes too easy. Nature does too much: there is little left for man to do. The simplicity of life so far as providing food is concerned has been emphasized by many writers. We are told that three bread-fruit trees furnish enough food for one man; that a laborer needs only twelve bananas for his daily food; that one day a week is enough time to spend in caring for a manioc plantation; that two days' work a week is often enough to enable a man to support a family; that a month's labor will provide for a Malay more sago than he can use in a year, etc. Stores are told of shipwrecked seamen in the tropical Pacific, who lived for many days on one cocoanut a day for each man. Capt. Cook put the case very emphatically when he said that a South Sea Islander who plants ten bread-fruit trees does as much towards providing food for his family as does a man in northern Europe who works throughout the year.

In a debilitating and enervating climate, without the necessity of work, the will to develop both the man who inhabits the tropics and also the resources of the tropics is generally lacking. Voluntary progress toward a higher civilization is not reasonably to be expected. The tropics must be developed under other auspices than their own: "Where nature lavishes food and winks at the neglect of clothing and shelter, there ignorance, superstition, physical prowess and sexual passion have an equal chance with intelligence, foresight, thought and self-control."† There is no superfluous energy for the higher things of life. Thus it has come about that the natives of the tropics have

* From a forthcoming book on *Climate*.

† John R. Commons, *The Chautauquan*, May, 1904, p. 222.

the general reputation of being indolent, and unreliable; of always being ready to put off until "to-morrow." Obviously, no such sweeping generalization is to be taken too literally, for the lower latitudes have produced many examples of the other kind, of men far from deficient in physical and intellectual powers, and in those parts of the tropics where natural conditions are more severe, the natives are usually more industrious. But it is true that the energetic and enterprising races of the world have not developed under the easy conditions of life in the tropics. As Edward Whymper's Swiss guide said of the natives of Ecuador, "it would be good for tropical peoples to have a winter." Guyot has put the case in this way: "A nature too rich, too prodigal of her gifts, does not compel man to snatch from her his daily bread by his daily toil. A regular climate, the absence of a dormant season, render forethought of little use to him. Nothing invites him to that struggle of intelligence against nature which raises the forces of man to so high a pitch, but which would seem here to be hopeless. Thus he never dreams of resisting this all-powerful physical nature; he is conquered by her; he submits to the yoke, and becomes again the animal man,—forgetful of his high moral destination." The movements of the body; the habit of carrying loads on the head; even the native dances, have been thought by some to show the enervating effects of the climate. One writer has even gone so far as to see similar effects in the domestic animals, which he believes to be more docile than those in extra-tropical latitudes.

THE LABOR PROBLEM IN THE TROPICS.—"What possible means are there of inducing the inhabitants of the tropics to undertake steady and continuous work, if local conditions are such that from the mere bounty of nature all the ambitions of the people can be gratified without any considerable amount of labor?" In these words Alleyne Ireland well sums up the labor problems in the tropics. If the natives are, on the whole, disinclined to work of their own accord, then either forced native labor, which is contrary to the spirit of the times, or imported indentured labor, becomes inevitable if the tropics are to be developed. With few exceptions, and those where the pressure of a large population necessitates labor, effective development has been accomplished only where imported Chinese, Japanese or coolie labor has been employed, under some form of contract. Negro slavery began in the West Indies, under early Spanish rule, and its perpetuation was certainly in part aided by climatic controls. The best development of many tropical lands depends to-day upon Chinese labor. It will be so in the Philippines. In Java, Holland has succeeded by forcing the natives to work.

With a large native class, which is indolent, working intermittently for low wages, or which is bound under some form of contract, it follows that the native or imported laboring classes are separated by a broad gulf from the upper employing class, which is usually essentially foreign and white. The latter class tends to become despotic; the former, to become servile. Marked social inequalities thus result, accentuated by the fact that the foreign-born white is usually debarred from all hard labor in a hot tropical climate. White laborers are not likely to become dominant in the tropics for two reasons,—first, because the climate is against them, and, second, because the native is already there, and his labor is cheaper. White men are not doing the hard daily labor of India, or of Java, or of the Philippines, or even of Hawaii. They are directing it.

THE GOVERNMENT OF TROPICAL POSSESSIONS.—The government of European possessions in the tropics has thus far been determined chiefly by three considerations: (1) The general incapacity of the natives, through ignorance, or lack of interest, or their generally undeveloped condition, to govern themselves properly. (2) The fact that the white residents are generally comparatively few in number and are only temporarily in the country, to make money and then to go home again. The white population is often chiefly composed of men—soldiers, officials, merchants, adventurers. There is little inducement to found permanent homes. (3) The marked class distinctions already referred to. These generalizations must obviously not be carried too far. Hawaii, very favorably situated as regards climate, will in time become an American State, and Brazil, most of whose immense area is typically tropical, has an increasing European immigration of permanent settlers. But what has been said is, in the main, true. The white residents constitute a caste, and naturally become the rulers, the home government retaining general control, often by force of arms. The native population, although largely in the majority, may have little or no voice in its own government. This is clearly not a democracy. It thus comes that the tropics are governed largely from the temperate zone; the standards, ideals, motives, come from another land. And where governed under their own auspices, as independent republics, the success has not been startling. Buckle first strongly emphasized the point that hot countries are conducive to despotism and cold countries to freedom and independence, and James Bryce has recently clearly set forth the climatic control of government in an article on "British Experience in the Government of Colonies" (*Century*, Mar., 1899, 718-

729). The very Europeans who exercise the controlling power in the tropics themselves tend to become enervated if they live there long; they lose many of the standards and ideals with which they started; they not uncommonly tend rather to fall towards the level of the natives than to raise the standards of the latter. The peculiar situation which may arise from the government of a tropical possession in which the white race does not become acclimated has been emphasized by Dr. Goldwin Smith in a recent discussion of British rule in India. "British Empire in India," he says, "is in no danger of being brought to an end by a Russian invasion. It does not seem to be in much danger of being brought to an end by internal rebellion. Yet it must end. Such is the decree of nature. In that climate British children cannot be reared. No race can forever hold and rule a land in which it cannot rear its children." The future of tropical possessions and "spheres of influence" offers many problems of great complexity, the solution of which is largely controlled by the factor of climate.

PRIMITIVE CIVILIZATION AND THE TROPICS.—There are reasons for thinking that primitive, pre-civilized man, in his earliest stages, when most helpless, was an inhabitant of the tropics; that he lived under the mild, uniform, genial climate of that zone, where food was easily obtained and protection against the inclemencies of the weather least necessary. There has been a feeling that southern Asia, bordering on the Indian Ocean, with its numerous bays, was probably the cradle of humanity. Civilized man is believed by many to have appeared first on the delta formed at the head of the Persian Gulf by the Tigris and Euphrates rivers, where also wheat was very likely first grown. Ancient civilizations seem to have developed in the drier portions of the tropics, where irrigation was necessary in order to insure abundant and regular crops, and where lived races more energetic and more hardy than those of the damper and rainier portions of the tropics, with more luxuriant vegetation. As Professor Hilgard* has well said: "It is hardly doubtful that the ancient 'Kulturvölker' recognized these advantages (of irrigated lands) by experience, and eschewed the laborious task of rendering cultivable the comparatively infertile, or, at least, readily exhausted, lands of the forest regions And it is also clear that, inasmuch as the establishment and maintenance of irrigation canals necessarily involve cooperation, and therefore a rather high degree of social organization, the conditions of the arid regions were exceptionally con-

*E. W. Hilgard: "The Causes of the Development of Ancient Civilizations in Arid Countries," *No. Amer. Rev.*, Vol. 175, 1902, p. 314.

ductive to the establishment of the highly complex polities of which the vestiges are now being unearthed in what we are in the habit of calling deserts." Civilization was thus probably first developed, not where the overwhelming superabundance of nature's gifts seems to offer the best conditions, but where man was under some stress of labor, some spur to effort, in less favorable natural conditions, but such as developed him. Within the tropics, the greatest progress later came, not on the damp lowlands, but on the less fertile plateaus of Mexico and of Peru, where the Aztecs and Incas made their marvellous progress in the drier, cooler and more rigorous climates of altitudes of over 7,000 or 8,000 feet above sea-level. Ratzel has pointed out, in the case of the ruins found on the lowlands of Yucatan and of Farther India, that when such building operations are carried through by the autocratic rule over a subject class the situation is very different from that in which we see spontaneous action on the part of a whole people.

The nations living in ease on the tropical lowlands were naturally, from early days, the object of frequent attacks and invasions at the hands of the more active and more warlike races living in more rigorous climates farther north, or at great altitudes on mountains or plateaus. The invading tribes, having in time become enervated by an easy existence on the warm lowlands, have themselves often been later overcome by a new enemy from the north. Some of the greatest migratory movements in history have taken place from colder to warmer climates, as part of this general equatorward tendency in both temperate and tropical zones. The barbarous tribes broke through the northern passes and descended on the more genial and more fruitful lowlands of India, being helped to do this by the ease of the descent. Such mountain systems as the Himalayas, or the Alps, stretching east and west, are natural climatic divides between more genial and more severe climates and have often been crossed by invading armies from the north. The descent of the Aryans into India; the Manchurian conquest of China; the invasions of Greece and Italy from the north; the southward movement of Toltecs and Aztecs in Mexico, have been cited as illustrations of this equatorward tendency. In the Southern Hemisphere it has been suggested that the Kaffirs have shown the same tendency, there northward; as did the native Patagonians in their predatory expeditions to the north. The equatorward tendency may be seen to-day in the extension of European "spheres of influence," especially in Africa, the object now being essentially a mercenary one, and not a seeking for new homes in a more genial climate.

LAKE OF THE UINTA MOUNTAINS.*

BY

WALLACE W. ATWOOD.

The Uinta Mountains, located in the northeastern portion of Utah, are not commonly visited, and therefore retain a primeval condition that has a special charm to true lovers of nature. The rugged peaks of deep red rock rise to elevations between 10,000 and 13,500 feet. Dense pine forests clothe the gentler slopes, and in the valley bottoms there are extensive meadowlands. The summer climate is mild and not too wet; feathered game is abundant and there is some large game; the lakes and streams abound in fish, and in all ways the western portion of the range is an ideal camping ground.

A panoramic view from any one of the lofty peaks of the Uinta Mountains would include scores of beautiful glacial lakes. These lakes are grouped in great amphitheatral areas near the crest line of the range. They are commonly surrounded by a dense forest growth, and when seen from a high peak must be classed among the most attractive scenic features of the range (Fig. 1). From the summit of Bald Mountain 70 lakes may be seen, and in the basin of Provo Cañon 43 lakes were counted from a single outlook point. There are more than 500 lakes in the range.

The great amphitheatral areas, where the lakes are grouped, were the catchment areas for the glaciers that formerly existed among these mountains. They are broad, flat-bottomed basins bordered by precipitous walls that rise 1,000 to 2,000 feet. The unforested portions of the basin-floors are commonly without soil, and the bare rock surfaces exposed yet retain the striations and grooves made by the ancient glaciers. In several instances the glacier ice gouged out deep basins in the solid rock, and such basins are now commonly occupied by water. The bed rock surrounding these lakes is usually polished and striated, and in some cases striæ and glacial grooves may be seen beneath the water.

In the basin of the Weber Cañon, the ice gouged out the alternately softer beds in a series of inclined strata, and in the depressions there are now chains of rock-basin lakes separated from each other by the ridges of harder rock (Fig. 2). On the main divide of

* Published by permission of the Director of the U. S. Geological Survey.

the range and just north of Mount Watson, at the head of Provo Cañon, there are five small lakes. At one end of the chain the striæ point northward into one of the headwaters of the Weber. At the



FIGURE 1.



FIGURE 2.

other end of the chain the movement of the ice was to the south into the Provo Cañon.

Most of the lakes among the Uinta Mountains are in drift basins formed by the irregular distribution of the morainic deposits. In

the great gathering grounds or catchment areas where the glaciers originated, most of these drift-basin lakes are in the ground moraine or rolling deposits on the floors of the catchment areas (see Fig. 1). Some are located at the margin of the catchment areas where the rock wall forms one boundary (Fig. 3). In such cases the lake basin may be in part in solid rock gouged out by the ice and in part formed by morainic deposits, so lodged as to block drainage from that area.

In the cañons the drift-basin lakes are either among the hummocks of a morainic ridge crossing the cañon or just up stream from such a ridge (Fig. 4). In certain valleys the morainic ridges have ponded the drainage at several points and so developed chains of lakes. These lakes are usually connected by a stream which is actively engaged in lowering the outlets and thus hastening the obliteration of the lakes.

Most, if not all, of the lakes are being invaded by plant life, and successive stages of vegetal filling are shown. Some of the lakes have the long-stemmed pond lilies working out from the shores (Fig. 5), others with pond lilies in the centre have zones of rushes and grasses advancing from the margins and fast crowding out the lilies. Fig. 6 shows a small lake with the central portion so occupied by a small flowering plant that no considerable body of water is exposed. Finally, the grasses reach the centre and a meadow marks the site of the former lake. In some of the cañons chains of meadows now exist where formerly there were chains of lakes. The lowering of the lake outlets and the growth of vegetable matter have assisted in the development of the meadows.

Another class of lakes is due to the ponding of tributary streams by the lateral moraines of the main cañon. Such lakes were much more common than at present, but their waters have either found seepage routes through the morainic dams or they have risen, overflowed and cut narrow V-shaped notches as outlets to the main. They were in hanging valleys, and when their outlets were cut to the level of the tributary valleys, the waters yet had 300 to 500 feet to descend before reaching the main stream. The descent from the tributary to the main is now accomplished by a series of falls or cascades.

A few small lakes exist between the lateral moraines of adjoining cañons. The space available for such a lake basin is just above the junction of the two lateral moraines where a medial moraine is formed.

There is one crescent-shaped lake in the range lodged between

a lateral moraine and a cañon wall. At a sharp turn in the course of one of the ancient glaciers, it appears that the ice, in making the turn, did not quite conform to the cañon, but swung out from the



FIGURE 3.



FIGURE 4.

wall far enough to form a small basin. During the presence of the glacier the ice formed a large part of the basin rim, and drainage from the ice presumably filled the basin. Since the retreat of the glacier, a lateral moraine which was deposited where the edge of

the ice rested has effectually blocked the drainage from this area and thus preserved a lake basin.

The only exception to the glacial origin for the lake basins of



FIGURE 5.

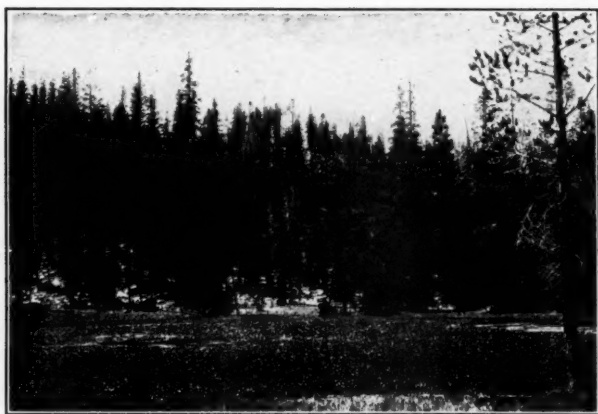


FIGURE 6.

the Uinta Mountains is found in a few basins that are due to landslides. The lakes in landslide basins are lenticular in form with their longer axes parallel to the cliff from which the land loosened and slipped.

In a few cases simple efforts have been made to control the lake waters for irrigation. In many cases, outlets of former glacial lakes could be closed by inexpensive dams and new reservoirs made. Many of the younger terminal moraines in the cañons have but narrow notches cut through them. If these post-glacial notches were closed, extensive reservoirs would be formed in the lower portions of the cañons. Such waters would be of immediate value on the ranch-lands at the north and south margins of the range. But each year the streams are lowering the outlets of the lakes, and both widening and deepening the cuts through the moraines in the cañons, and therefore the amount of work necessary to get control of the water-supply in the range steadily increases.

LAKE IBRAHIM: A PROTEST AND A DECISION.

Lake Ibrahim is an expansion of the Nile between Urondogani and Mruli, a portion of the river unknown to the geographers of the world until the year 1874, when Col. Ch. Chaillé-Long, Chief of Staff under Gen. Gordon, Governor of the Egyptian Equatorial Provinces, having concluded with M'Tesa, King of Uganda, the treaty which extended the jurisdiction of Egypt over the entire Nile basin, embarked at Urondogani on the Victoria Nile, discovered and explored the great lake beyond and landed at a point opposite Mruli.

Of this expedition Gen. Gordon wrote in a letter published in the *New York Herald* of January 23, 1880:

"Those who care to study the successive steps which built up the map of the course of the Nile will know that to Speke is due the discovery of one portion, to Baker that of another, and to Col. Chaillé-Long that of another portion and of the lake alluded to."

It was the Khedive Ismail who gave the name *Ibrahim* to the lake discovered by Chaillé-Long.

This was for several years the accepted name of the lake, sometimes with the addition of a native name, *Kodja*, *Choga*, or *Gita Nzige*, as in Ravenstein's map of East Equatorial Africa, published under the authority of the Royal Geographical Society by E. Stanford, in 1882.*

After the year 1882 (the date of the British occupation of Egypt),

*In this map the date of Chaillé-Long's discovery of Lake Ibrahim is erroneously printed 1875, instead of 1874.

Lake Ibrahim began to disappear from the maps, its place being taken by one or another of the native names, according to the caprice of the map-maker.

Col. Chaillé-Long lost no opportunity of protesting against this arbitrary suppression of the name bestowed upon the lake, in the exercise of his unquestionable right, by the sovereign of Egypt.

In June, 1901, Col. Chaillé-Long addressed a letter on this subject to Gen. Bassot, Sub-Chief of the General Staff and Director of the Geographical Service of the French Army, and received the following reply:

"There is for a fact identity between Lake Ibrahim and the lake traced by Macdonald in 1897 and named by him *Choga*. Besides, all the lakes of this region have retained the European names with which their discoverers have baptized them (Victoria, Albert, Rodolphe, etc.). There is not, therefore, any reason not to maintain that of *Lake Ibrahim*, and this name will be again adopted for subsequent editions of sheet No. 36 of the map of Africa."

A representation to the Royal Geographical Society on the 6th of March, 1904, elicited no response, and on the 6th of October, 1907, Col. Chaillé-Long wrote to the President of that Society, Sir George Taubman Goldie, a letter which closed with these words:

"I have the hope that you, Mr. President, after investigation of the case which is given in detail in the BULLETINS of the American Geographical Society for January and June, 1904, will do me justice by restoring the name of Lake Ibrahim which connects me with its discovery and thus render further protestation unnecessary."

To this letter the following reply was received:

ROYAL GEOGRAPHICAL SOCIETY
1 Savile Row
Burlington Gardens
London, W.
Nov. 13, 1907

Colonel CHAILLÉ-LONG
Chevy Chase, Md.

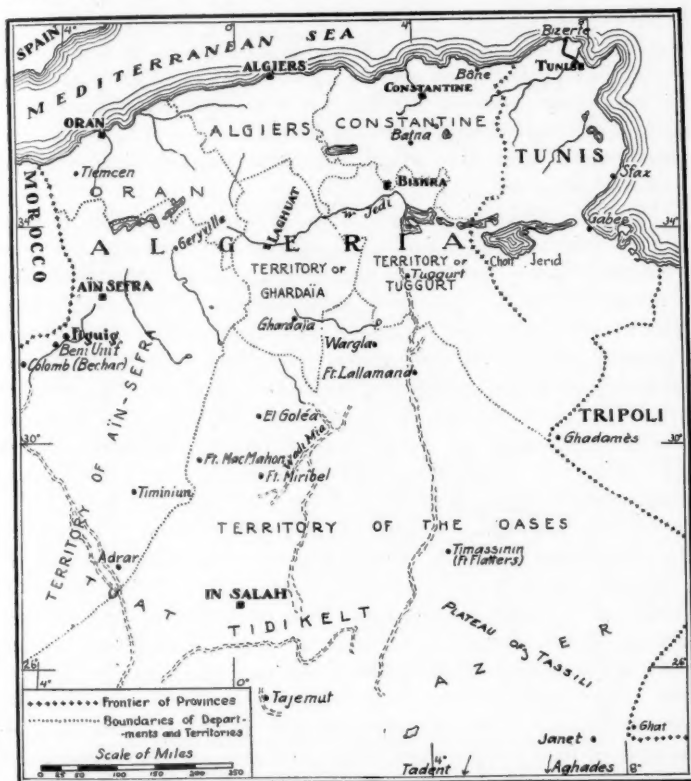
DEAR SIR:

In accordance with the request in your letter of the 6th ultimo, I have brought its subject matter before the first meeting of the Council of the Society after our recess. After due consideration, standing instructions have been issued to the Mapping Department that in all such maps, issued by the authority of the Society, as are on a sufficiently large scale to make it practicable, the name "*Lake Ibrahim*" shall be added, in brackets, to the native name, as was done in the Society's map prepared by Mr. Ravenstein.

I have the honour to be, Sir,
Your obedient servant
GEORGE TAUBMAN-GOLDIE
President R. G. S.

PROGRESS IN THE ALGERIAN SAHARA.

The French have been organizing territorial governments in the Sahara south of Algeria. Many facts relating to progress in this portion of the desert are given in *A Travers le Monde* (Nov. 2, 1907), with a map showing the boundaries of the new territories.



FRENCH TERRITORIES IN THE SAHARA.

This map has been used in making our sketch map. It should be understood that the new territories include the oases at Biskra, Wady Rhir and other places that have long had important development.

The Sahara to the south of Algeria has been divided into four

territories: Aïn Sefra, with the town of the same name as its administrative centre; Ghardaïa, capital, Laghouat; Tuggurt, capital Biskra; and the much larger region south of these territories has been organized as the Territory of the Oases with In Salah as capital.

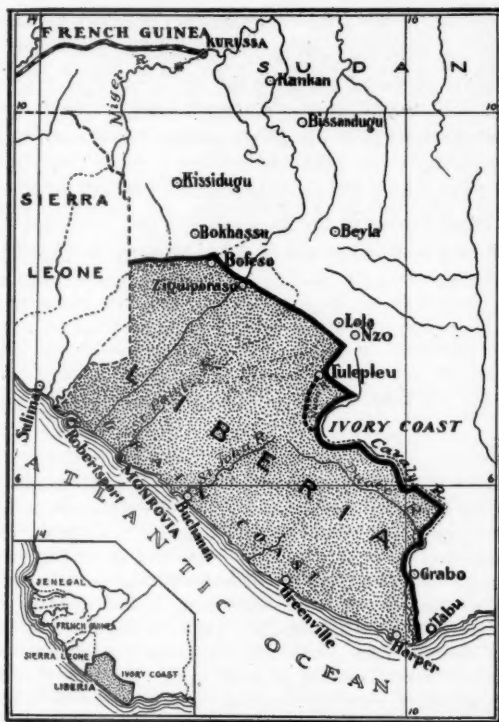
The census of the entire region included in these territories was taken at the same time with the Algerian census, in 1906. The population numbers about 446,000 persons, including 2,644 Europeans. This is about 81,000 more inhabitants than the region is said to have contained in 1901. The extension of the railroad to Bécharr and the building of the new towns of Colomb and Beni Ounif have attracted many European traders and others. The chief reason for the growth of the native population is that the free medical dispensaries which the Government has opened at every post have attracted many natives who have made new homes within easy reach of modern medical aid.

The Government of Algeria began in 1905 to establish Sociétés de Prévoyance, whose mission is to suggest and carry out measures for improving the condition of the natives. In 1906 there were nine of these societies. They supplied an adequate amount of grain to the oases to use as seed after the bad season of 1905, have to some extent reformed usurious rates of interest and have opened forty-three public schools in the oases. The book instruction is merely elementary. The constant effort is to accustom the pupils to habits of neatness and order and to teach them how to use labour-saving implements and the best methods of tilling the soil in the oases. These schools are doing well. All the pupils are taught to speak the French language. In addition to these elementary schools, a few others give somewhat more advanced instruction in arithmetic, geography, and history.

Meanwhile, great progress has been made in studying the resources of the territories. It is found that the oases are giving pasturage to about 1,500,000 sheep, 500,000 goats, nearly 100,000 camels, and 15,000 cattle. Grain raising is an accessory industry, but cereals cannot supplant dates as the chief crop. The date is the basis of food and the chief agricultural export. At present there is no trade between the oases and the Sudan, but it is expected that this trade will be revived.

LIBERIA'S NEW BOUNDARY.

This sketch map of the boundary between Liberia and the French possessions in West Africa is based upon a map in *À Travers le Monde* (*Le Tour du Monde*, No. 45, 1907). The agreement concerning the frontier was reached during the recent visit of President Barclay of Liberia to Paris.



LIBERIA'S NEW BOUNDARY.

The agreement is practically that suggested by France two years ago according to the reference in Sir Harry Johnston's *Liberia* (Vol. I, p. 311). It involves the surrender by Liberia of territory to the north of the Cavally river, an area of about 2,000 square miles in the extreme upper basins of the St. Paul and Lofa rivers. On the other hand, it gives Liberia a tolerably well-defined boundary from a

geographical standpoint, in place of the previous, purely conventional boundary.

A short stretch of the eastern frontier is still involved in doubt, because of the insufficiency of our geographical knowledge. The agreement stipulates that the boundary shall follow the course of the Nuon river to its confluence with the Cavally, and then follow that river to the sea. It is not certainly known, however, whether the Nuon is really a tributary of the Cavally; therefore it is provided that if it is found that the Nuon does not unite with the Cavally the line shall run south-east from Tulepleu to the upper Cavally, leaving the Nuon to the west and giving Liberia a little more territory.

Twenty-five years ago this month a treaty was made between France and Liberia fixing the boundary between their possessions. It failed of effect because the geographical notions on which it was based were shown to be worthless.

While Liberia loses territory heretofore claimed in the northeast and in the upper basins of the St. Paul and Lofa rivers, her territory in the southeast widens enough to make up the loss in the north.

GEOGRAPHICAL RECORD.

AFRICA.

THE AFRICAN TRANSCONTINENTAL TELEGRAPH.—Sir Lewis Mitchell, in an address before the Society of Arts, London (*Jour. of the Soc. of Arts*, No. 2822), said that the wires of this line had been erected for 1,584 miles. The starting point is Umtali on the Mashonaland Railroad, and it follows northward the eastern boundary of South Rhodesia, traverses Portuguese East Africa, crosses the Zambezi at Tete and serves the well-known missionary centre of Blantyre, runs through the coffee growing districts of the Shire Highlands to Fort Johnston on the south coast of Lake Nyasa; then advances through the entire length of British Central Africa, touching at many rising villages on the west coast of the lake and following these shores to the north end, whence it crosses to the south end of Lake Tanganyika, and follows the east coast through German territory to Ujiji, its present terminus. It is already serving many public and private interests, assists in the preservation of law and order and is of great and growing commercial value.

HAIL AT CAIRO.—According to *Nature*, Nov. 7, 1907, a remarkable hailstorm occurred in Cairo on Oct. 21, preceded by lightning from 6 to 7:30 P.M. The hailstones averaged about an inch in diameter, the largest ones measuring up to 1.4 inch. The storm lasted a quarter of an hour. Such storms are very rare in Egypt. The sudden downpour of hail caused great excitement among the na-

tives. Most of the hailstones were spheroidal in shape, with white nuclei. The temperature at the time was 77°. There was nothing in the weather conditions which was noticeable as exceptional on the weather map. The hailstorm was very limited in extent, and moved northwest to southeast. Taking account of the usual rate of vertical decrease of temperature at Cairo, the minimum height from which the hail came must have been about 8,000 feet. R. DEC. W.

AMERICA.

SOIL SURVEY MAPS.—Seven of the lithographed maps issued by the Bureau of Soils in the Department of Agriculture were published in October. The maps are drawn on a scale of about one mile to an inch, and the location and extent of the various soil types are indicated in colours. The survey parties are sent to one district or another at the request of citizens, agricultural societies, State officials and others, and soil surveys are made wherever there is special demand for them. In regions where the Government topographic sheets are available for base maps a considerable number of contours of elevation are introduced. Two men form each of the survey parties. They are equipped with the most modern instruments for the classification and survey of soils, and their map is completed in all details and their report written before they leave the area studied. The scale is a mile to an inch, which is large enough to permit areas of ten acres to be represented. Twelve or more tints are often used on a sheet to show the different kinds of soil; the boundaries of the soil areas are sharply defined and a close approximation of the facts is attained. Sections show the thickness of the soils and the nature of the subsoil to a depth of three feet. The maps are well produced and are serving a very useful purpose. Somewhat similar work has been carried out in the Netherlands where wall maps, showing in colours the nature of the soils and their distribution, are published for use in the schools.

FOSSILS IN THE CRETACEOUS FORMATIONS OF NEW JERSEY.—The Geological Survey of New Jersey has published a volume of 871 pp., with an accompanying volume of plates and explanations, entitled "A Report on the Cretaceous Paleontology of New Jersey," by Stuart Weller. The report is based upon the stratigraphic studies of George N. Knapp and forms a part of Dr. Kummel's Annual Report of the Survey for 1906, but is issued separately because of its technical character. The Cretaceous formations are better developed in New Jersey than in any other State on the Atlantic coast and the New Jersey section has long been regarded by geologists as one of great importance. The formations occupy a belt extending diagonally across the State in a northeast-southwest direction from Raritan Bay to Salem County. Part I is a discussion of the stratigraphic paleontology of the region and is based upon very extensive collections made in the field by Mr. Weller during 1903 and 1904. Part II is devoted to the descriptive paleontology and is in large part a revision of Whitfield's work in the light of the more extensive collections now available and of our more accurate knowledge of the stratigraphy of the region. The plates are from excellent photographs.

COTTON STATISTICS IN THE UNITED STATES.—Bulletin 90 of the Census Bureau reports that in the year ending Aug. 31, 1907, there were in the United States 1,830 cotton mills, with 26,939,415 spindles. The cotton consumed was 4,984,936 bales or 2,487,099,619 pounds.

WATERFALL IN BRITISH GUIANA.—According to Reuter, an important discovery was made in British Guiana, in November, by Dr. Carl Bovallius, the managing director of the New Essequibo Exploration Company. He found on an affluent of the Ireng river close to the Brazilian boundary, in about 5° N. Lat. and 60° 9" W. Long., a waterfall rivalling Niagara in height. The wall of the cliff over which the water pours is slightly convex and shows red, highly polished jasper in places. At the base there is an oval basin which empties, about one hundred yards from the first fall, over a second some 30 feet in height. Dr. Bovallius has suggested to the Governor that it be called the Chamberlain Falls in honour of the Colonial Secretary.

POPULATION OF THE STATE OF OKLAHOMA.—Oklahoma and the Indian Territories were admitted into the Union in November, as the State of Oklahoma. The President directed, in June last, that a special census be taken of the proposed new State and the results are printed in Census Bulletin 89. The population is now 1,414,217, as compared with a population in 1900 of 790,391, an increase in seven years of 623,786 or 78.9 per cent.

The whites number 1,226,930 (656,473 males, 570,457 females); the negroes 112,200 (58,277 males, 53,923 females); the Indians 75,012 (37,582 males, 37,430 females); Mongolians, 70 males and 5 females.

ASIA.

A RAILROAD FROM THE LOWER YANGTSE TO SZECHUEN.—One of the most important railroads in the Chinese Empire will be that which is to extend between the lower Yangtse and the western province of Szechuen. This province is not only the largest in the empire, but is also the richest in natural resources and in the well-being of its people. Its facilities for trade relations with other parts of the country are, however, very poor. Its only natural trade route is the Yangtse river, but from the frontier of Hupeh in the east, far into Szechuen, the current is so swift and the channel is impeded by so many rapids that navigation is almost impossible. Furthermore, the richest agricultural region of the province, the Red Basin, so-called by Baron von Richthofen from the red sandstone that forms its soil, is very mountainous and although the eastern ranges are not so high as those of the north and west, it will be a costly enterprise to build a railroad across them.

The Chinese, however, are convinced of the necessity of building this road and are taking steps preparatory to starting the work. The estimated cost is 50,000,000 taels (nearly \$40,000,000). The Chinese are desirous to supply all the capital themselves, but they are finding much difficulty in raising the money. Thus far Szechuen has subscribed only \$625,000 and Hupeh \$500,000 to the fund. There is no doubt that this railroad, when completed, will be a more profitable property than the new line between Peking and Hankow which, last year, paid a dividend of 6 per cent. (E. Tiessen in the *Zeitschrift* of the Berlin Geog. Soc., No. 9, 1907.)

RAINFALL IN THE PHILIPPINES.—A recent publication of the Philippine Weather Bureau deals with *The Rainfall in the Philippines*, and was prepared under the direction of Rev. José Algué, S. J., by Rev. Miguel Saderra Masó, S. J. (Manila, 1907, 4to, pp. 31). Rainfall measurements have been made at about 60 stations throughout the islands, but with many interruptions. Over most of the archipelago the maximum rainfall comes in summer and autumn (June-October), the "rainy season." In November-February rain falls abundantly on the east and north

coasts, giving the districts which face the Pacific Ocean and the larger inland water areas a second rainy season. March, April and May are the driest months, although thunderstorms are then becoming more frequent. The spring and autumn rainfall is classed as cyclonic. The winter rains come with the northeast monsoon. The spring rainfall comes in thunderstorms.

There are three zones, or climates, classified according to their rainfall seasons, viz.: 1. Zone of very definite rainy and dry seasons, on the west coasts of Luzon, Mindoro and Panay; the central plains and moderately high lands of Luzon, and the region of Benguet. The annual rainfall is over 2,000 mms. in the western section and in Benguet, and between 1,500 and 2,000 mms. in the central section. 2. Zones or regions with a long rainy season (summer, autumn and winter) and a very short dry period. These include the north and east coasts and the southeastern part of Luzon, central Visayas, western Cebu, northern Panay and Negros and northern Mindanao. The annual rainfall is above 3,000 mms. in northern Panay, and between 2,000 and 3,000 mms. in northern and eastern Luzon; below 2,000 mms. in the Cagayan valley of Luzon and in northern Mindanao. 3. Zones with more or less uniform distribution of rainfall through the year. These cover the southeastern end of Luzon, the eastern Visayas, Samar, Leyte, eastern Cebu, eastern and southern Negros, and Panay; the eastern and southern coasts of Mindanao, etc. At some coast stations the annual amount is over 3,000 mms. Elsewhere it is between 2,000 and 3,000 mms., or in places below 2,000 mms.

The monthly rainfalls at all stations in the Philippines are tabulated at the end of the Report, but there is no map.
R. DeC. W.

GOOD MAPS OF CHINA NEEDED.—Mr. Franz Woas, who has been travelling in China, writes to *Petermanns Mitteilungen* (No. 10, 1907) that the maps he took with him were too unreliable to be helpful. When the allied troops marched on Peking, in the days of the Boxer troubles, many army officers declared that the available maps were worse than useless because they were misleading. The foreign forces were embarrassed when they reached Peking, because the latest plan of the capital in their hands had been published forty years earlier. When peace was restored the Germans extended a rapid reconnaissance survey over many districts, collated important map work by explorers from the days of Richthofen and the Prussian Land Survey, and used all the material to produce map sheets covering the whole of eastern China. The map looks well, but Mr. Woas says that it repeatedly deceived him during his overland journey northward from the coast of Fokien. He could not find the mountains charted along the Min river, the river courses are not accurately shown, the spelling of the place names does not represent the local pronunciation and there are other grave deficiencies. He found the large Chinese map of eastern China still more unreliable. It shows important towns on the wrong sides of rivers and a day's use of the map convinced him that it was not worth while to carry it any farther.

AUSTRALASIA.

DR. PÖCH'S STUDIES IN NEW GUINEA.—The paper written by Dr. Rudolf Pöch on his ethnological studies in New Guinea, in 1904-1906, was noticed in the September number of the *BULLETIN* (p. 360). The Society has since received from

him two papers more recently published from which the following information is extracted:*

He observed among the mountains of German New Guinea the production of fire by rubbing a piece of wood with a rotang (one of the rattan palms) rope. This method, he says, has been almost unknown, though it seems to be widely spread in New Guinea and is characteristic also of the Negritos in the Philippines.

He found among the Kworafi at Cape Nelson, British New Guinea, peculiar mourning caps and jackets ornamented with the seeds of *Coix Lacryma*.

Some inland tribes in the north-eastern part of British New Guinea wear long and heavy pigtails.

Dr. Pöch, at Wanigela, Collingwood Bay, found, as the result of his excavations, many articles, including ancient pottery, a carved shell, and small obsidian implements. These finds seem to show that the art of pottery-making has deteriorated in this part of New Guinea. The designs on the old pottery are much superior to any now made and the natives of to-day do not know how to carve shells or to make handles and necks on their potteries. These objects seem to be traces of an ancient, forgotten and, in some respects, higher stage of culture than that now existing.

He says in the second paper that the island presents a large variety of anthropological types. He found tall natives on the coasts, some almost dwarfish inland tribes, woolly, wavy and nearly straight hair, high noses and broad flat noses, black natives at Bougainville and light brown ones on the south coast.

He used the phonograph to reproduce languages, tales and songs. In the songs, melody is very little developed and the rhythm is sometimes surprisingly complicated. Cinematograph films were also procured. The cinematographic work was difficult as the native groups were always on the move, and Dr. Pöch had to follow them with the machine. It was months also before the films could be developed; about three-fifths of these pictures, however, turned out well and among the views are some of the dances among the tribes of northeast New Guinea, women at their toil, a man splitting off a bit of obsidian and shaving another with the flake—a real picture of the stone age.

Dr. Pöch started in November for German Southwest Africa, under the auspices of the Imperial Academy of Vienna, to study the Bushmen of the Kalahari. He hopes to make contributions to the anthropology and ethnology of this dying race, and will go from Windhuk to the regions in the desert where remnants of this nomadic people are still living.

POLAR.

ICE CONDITIONS AT THE WESTERN END OF AMUNDSEN'S NORTH-WEST PASSAGE.—Last summer the ice conditions at the western mouth of Dolphin and Union Strait, between Nelson Head and Cape Parry, were different from those supposed commonly to prevail there. Captain George B. Leavitt, of Portland, Me., the commander of the steam whaler *Narwhal*, reports that at no time before August 14 was it possible to get east past Nelson Head. "The ice," he writes, "was solid all the way across" (to Cape Parry).

Literature on ice conditions in this region is not, of course, extensive. On

Einige bemerkenswerte ethnologische aus Neu-Guinea. Von Dr. Rudolf Pöch. *Mitt. der Anthropologischen Gesellschaft in Wien*, Vol. 37, pp. 57-71. 8 Illustrations and 1 Table.

Reisen in Neu-Guinea in den Jahren 1904-1906. Von Dr. Rudolf Pöch. *Zeitsch. für Ethnologie*. Heft 3, 1907. 7 Illustrations in the text and 2 Tables.

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July 25, 1826, and again about the middle of August, 1848, Richardson saw ice to seaward off Cape Parry, but in neither case did it appear to him as likely to obstruct sailing ships. Late in August, 1850, M'Clure passed Nelson Head going eastward through an open sea; early in September, 1851, he came from the north through 100 miles of ice-free water between Banks Land and Prince Albert Land and rounded Nelson Head, going westward into an open sea against a heavy swell. On Aug. 26, 1851, Collinson found fragments of ice along the shore, but none to seaward; for the year 1852 his trouble with the ice in Prince of Wales Straits to the northeast of Nelson Head does not indicate that a modern steam whaler would have been seriously impeded, while off the Head itself the conditions for that year are unknown. On Aug. 28, 1853, Collinson sailed west between Parry and Nelson through open water.

Most of these explorers came to the neighborhood of Nelson Head rather late in the "open" season; nevertheless there was nothing in their experiences to contradict the general belief among whalers that the southern extremity of Banks Land could always be rounded early in the season. In the winter of 1905-6, Captain Klinkenberg, with the schooner *Olga*, wintered in Prince Albert Sound, Wollaston Land, and found no trouble in coming south and rounding Nelson Head, going west under sail in the first week of August. He saw many whales and no ice. In previous years the whalers wintering at Herschel Island were frequently barred in late July and early August from the whaling grounds southwest of Banks Land by an ice barrier, which they encountered sometimes near the eastern mouth of the Mackenzie, sometimes off Cape Bathurst. When they once got past this they always found open water to the eastward and the belief had grown up that wintering in the straits was safe, as the passage westward past the Head always opened early. Some, in fact, believed that currents around the south end of Banks Land kept the sea there always open. Several whalers had announced their intention of wintering next year on the west coast of Prince Albert Land, but this plan will probably be given up. Herschel Island is now considered by most of the whaling captains as the only harbor at all suitable for use by the San Francisco whaling fleet as winter quarters in the Arctic.

V. STEFANSSON.

VARIOUS.

CARTOGRAPHIC MUSEUM OF GENEVA.—According to the *Journal de Genève*, the Cartographic Museum of Geneva was formally opened to the public on Nov. 14, 1907. The inaugural exercises were attended by professors of the University and members of the various societies having geographical interests. Various addresses were made describing the origin, development and purpose of the Museum.

In 1893 M. Charles Perron presented to the city of Geneva the collection of nearly 7,000 maps which Elisée Reclus had used in writing his "*Nouvelle Géographie Universelle*," and which had formed the basis of the many admirable little maps which M. Perron, as the collaborator of the eminent French geographer, had drawn for this work. At first no adequate repository for the collection was available, but in 1901 three large rooms were given over to it in the Public Library, and an organization under the name of "*Dépôt des Cartes de la Ville*" was formed, of which M. Perron was made curator. It was the intention of the founder that the collection should be kept up to date, but the funds available, 300 frs. a year, were not sufficient for this purpose. Private donations, however, have been made which, together with the slight purchases possible, bring the collection to a total of nearly 10,000 separate maps and 86 atlases.

The main part of the collection is kept in 60 large portfolios and is at all times accessible to students. M. Perron has, however, made a selection of certain maps which he has grouped in five series, each illustrating a certain phase of geographical knowledge. These maps are exhibited in large glass covered cases and represent to the general public the Cartographic Museum. An explanatory catalogue has been published and is given free to visitors.

The first group contains world maps showing the development of geographical knowledge from the earliest times to the present day; the second and third groups contain maps showing the historical growth of Switzerland and the Canton of Geneva respectively; the fourth group shows the progress of oceanography, while the fifth traces the development of the art of map drawing and elucidates the various methods employed graphically to represent geographic phenomena.

The latter group covers the period from the sixth century B. C., represented by a fragment of a plan of Susa, found on an Assyrian tile, to the superb wall map of Switzerland, published under the auspices of the Government, which, in its plastic effect, represents the acme of the cartographer's art.

The remarks of all the speakers voiced the sentiment of admiration of the work which M. Perron has accomplished so well after years of patient effort and of the appreciation of the difficulties which beset him in executing an entirely original undertaking, with no models to follow. M. Perron hopes to be able to submit the result of his long years' work to the members of the Ninth International Geographic Congress when they meet in Geneva next summer. They, no doubt, will duplicate the sentiments of their Geneva colleagues. W. JOERG.

RAINFALL TYPES AND RAINFALL SEASONS.—An interesting investigation of rainfall types and of their influence upon the annual period of rainfall has been carried out by G. Schwalbe (*Ueber Niederschlagstypen und ihren Einfluss auf die jährliche Periode des Niederschlages, Met. Zeitschr.*, Sept., 1907). The data under discussion concern German stations only, but the conclusions are of wide application, and are certainly worthy of attention on the part of those who seek to make of climatology more than a mere dry tabulation. The general results of Schwalbe's study, are as follows:

1. The influence of thunderstorm rains upon the annual rainfall is considerable.
2. As thunderstorms occur almost wholly in summer, they tend to make the summer the season of maximum rainfall.
3. Without the thunderstorm rainfalls, the annual period (for central northern Germany) shows a tendency to heavier rains in spring and fall, with less rain in the extreme seasons.
4. In the interior parts of eastern Germany the continental type of summer rainfall maximum is marked, so that the annual period is not essentially altered by thunderstorms.
5. Rainfall which comes in showers is fairly equally distributed throughout the year.
6. Squalls have a maximum in spring and fall.
7. General rains have a winter maximum in coast districts, an autumn maximum in transition areas, and a summer maximum in the interior.

The rainfall types in this classification were as follows: 1. Squalls and showers. 2. General rains. 3. Transition type. 4. Thunderstorms.

R. DEC. W.

CLIMATE AND DURUM WHEAT.—There are many lines along which the relations of climate and crops may be studied, and such investigations are of special interest when they concern the effect of climate upon crops recently introduced into a new region. *The Effect of Climatic Conditions upon the Composition of Durum Wheat* is discussed by J. A. LeClerc, of the Bureau of Chemistry, in the *Yearbook of the Department of Agriculture* for 1906, pp. 199-212. Durum wheat is grown extensively in Russia, Algeria, Italy and Spain, and in the United States it is doing remarkably well on the Great Plains, where the climate is somewhat similar to that of the European countries from which the wheat came. The wheat grown in the drier localities of this country has a higher nitrogen content, the difference amounting to 0.57% of nitrogen, or 3.2% of protein. In the humid or irrigated areas the tendency of the wheat is to become mealy or starchy. Samples of Kubanka wheat grown in less than 15 inches of rainfall showed 2.7% of protein in excess of that in samples grown in localities with more than 15 inches of rainfall, or irrigated. An excessive amount of rainfall, or irrigation, is followed by a crop with a very low percentage of protein. Thus the observations of Lawes and Gilbert are corroborated, which showed that in England cold and rainy seasons gave the poorest crops.

Samples were grown in Colorado and Idaho, some under dryland farming and some under irrigation, and of these the former showed 4.16% more protein than the latter. Hot seasons produce the most abundant crops, and the longer the growing period, as a rule, the lower the percentage of protein. In Algeria, durum wheat contains only 8-10% of water. Common wheat, from countries where it grows well, contains from 10 to 16% of water, according to the moisture of the atmosphere. This fact led the French officials to look into the advisability of buying wheat from dry regions, thus saving in the cost of transportation and actually obtaining more wheat per bushel.

The above considerations show the importance of ascertaining the proper amount of water which should be used in irrigating durum wheat in the drier parts of the United States. European studies along similar lines are:—Schindler: *Der Weizen in seinen Beziehungen zum Klima*, Berlin, 1893, and discussions by Wollny in *Forschungen auf dem Gebiete der Agrikulturphysik*, VIII, 1885, 313; XVII, 1894, 209.

R. DE C. W.

MOUNTAIN SICKNESS.—Mr. T. G. Longstaff, the well-known mountaineer, has written a paper on "Mountain Sickness and Its Probable Causes," published by Spottiswoode & Co. He says that late in the eighteenth and early in the nineteenth centuries when research into physical science was eagerly pursued, mountain ascents were made only by scientific men, practised observers who expected to be severely affected by diminution of atmospheric pressure and noted even the smallest abnormal symptoms in themselves. Then much was heard of mountain sickness. But during the past half century, mountaineering has become a popular pastime, and the mountaineer, who is usually an athletic person, does not pay much attention to slight sicknesses and, indeed, several first-rate mountaineers have been led to express their disbelief in mountain sickness.

The author thinks that in the investigation of this illness too much attention has been paid to laboratory experiments and too little to actual experiences of mountaineers at high altitudes. He therefore presents abstracts from the accounts of all the highest mountaineering expeditions, from the attempt by the Spanish on Popocatepetl in the sixteenth century to the ill-fated Kinchinjanga expedition of

1905. He also considers the effects of high balloon ascents and of experiments in the pneumatic chamber and gives the results of his own personal observations at high altitudes.

He believes that mountain sickness consists of two elements: First, mountain lassitude, which few escape at altitudes of over 19,000 feet, and which is due to imperfect oxygenation; second, excessive fatigue and exhaustion, which affect the untrained and inexperienced far more frequently than the skilled mountaineer. The most numerous sufferers from mountain sickness are the untrained and persons of inferior or ordinary physique. Alpine guides are almost completely immune and this is due to their extraordinary physique and power of resistance.

The family of the late Professor Angelo Heilprin has presented to the Sheffield Scientific School the collection of lantern slides, comprising about 1,000 views taken by him in all parts of the world and used in his lectures on physical geography.

Professor Albert P. Brigham, who is on leave from Colgate University this year, spent the summer and autumn in geological field work under Dr. John M. Clarke, of the New York State Museum, and sailed on Nov. 28 for Genoa to join his family in Geneva. He will spend the winter in that city, then travel in southern Europe, attend the Ninth International Geographical Congress in Geneva in July and return to college duties in September.

The Belgian Senate has refused to give naturalization papers to the well-known Antarctic explorer Arctowski, although he was a very prominent member of the scientific staff on the *Belgica* expedition. (*Cologne Zeitung*, Aug. 9, 1907.)

Mr. Henry Gannett, geographer of the U. S. Geological Survey, is in Cuba, where he is superintending the taking of the census of the island.

THE AMERICAN GEOGRAPHICAL SOCIETY.—A Regular Meeting of the Society was held at Mendelssohn Hall, No. 119 West Fortieth Street, Tuesday, December 17, 1907, at 8.30 o'clock P.M.

President Huntington in the chair. The following person, recommended by the Council, was elected to Fellowship:

Francis F. Buzzacott.

The President then introduced Capt. Roald Amundsen, who addressed the Society on the North-West Passage and the Magnetic Pole.

Stereopticon views were shown.

On motion, the Society adjourned.

OBITUARY.

SIR FRANCIS MCCLINTOCK.—Admiral Sir Francis Leopold McClintock died in England in November, at the age of eighty-eight. His remarkable career as an Arctic explorer began in 1848, when he was second lieutenant on H. M. S. *Enterprise* in one of the Franklin Search expeditions. It was his fortune, in August, 1850, to see the first traces of the missing Franklin expedition. In 1851 he made a remarkable sledge journey on which he reached the most westerly point of the Arctic that had yet been attained from the east. He was very prominent in the later phases of the Franklin Search and his splendid sledge work made him the

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most distinguished of sledge travellers in that day. For many years the advances made in Arctic sledge travel were entirely due to the improvements he suggested.

The work, however, that contributed most to his fame was his discovery of the fate of Sir John Franklin and his party. In 1857 he accepted the command of the Search Expedition that Lady Franklin had fitted out. He sailed on July 1, 1857, with 24 companions, in the steam yacht *Fox* and returned on Sept. 20, 1859. He had discovered on the northwest shore a record announcing the death of Sir John Franklin and the abandonment of the *Erebus* and *Terror*. He brought home news of their discoveries and of the fate of their crews and many relics of the expedition. He told the story of this brilliantly successful voyage in a book entitled "The Voyage of the *Fox* in the Arctic Seas: a narrative of the Discovery of the Fate of Sir John Franklin and the abandonment of the *Erebus* and *Terror*." The book ran through many editions and is one of the classics of Arctic literature.

THE REV. W. G. LAWES, D.D.—Dr. Lawes died at his home, near Sydney, on Aug. 6, 1907. He made large contributions to our knowledge of New Guinea during his long service with the London Missionary Society. In the seventies, while living at Port Moresby and elsewhere on the south coast, he made several voyages and journeys into the interior and the valuable information he acquired was printed in the *Proceedings* of the Royal Geographical Society for 1880, together with communications concerning his later work in the volumes for 1882 and 1883.

NEW MAPS.

AFRICA.

GOLD COAST.—Scale, 1:125,000 or 1.9 statute miles to an inch. Sheets, 72-L-111 (Kibbi), 72-Q-IV (Cape Coast), 72-R-111 and 72-R-IV (Winneba and Nianyan). Published under the direction of Major F. G. Guggisberg, Director of Surveys, Gold Coast. W. & A. K. Johnston, Edinburgh and London, 1907. (Price, 2s. a sheet.)

These sheets are a continuation of the map already noticed in the *BULLETIN* for October and December, 1907. The rules for pronunciation and spelling of names are given on each sheet. No redundant letters are used, every letter is pronounced and the original spelling of familiar names is retained, the correct spelling being placed in brackets. Large areas, still unsurveyed, are left white, but as the pioneer scientific map of the country this product will be very useful.

CENTRAL AND SOUTH AFRICA.—Central and South Africa. Scale, 1:5,000,000 or 78.9 statute miles to an inch. With insets of Cape Town, Port Elizabeth, East London, Durban, Lourenço Marques and the mouths of the Zambezi river on larger scales. By J. G. Bartholomew. John Bartholomew & Co., Edinburgh, 1907. (Price, paper, 2s.; cloth, 3s.)

A revised edition of this well-known map. It includes the whole southern part of the continent from southern Cameroons, the Congo Free State, Uganda and British East Africa to the Cape of Good Hope. On the whole, it is the most convenient and informing map in one sheet of this vast area of development. In

most respects it has been thoroughly brought down to date. It is the first important map to show the system of transportation by steamer and rail on and along the Congo between the Atlantic and the Katanga mining region, over 2,000 miles, as it will appear when completed. It shows the finished and projected parts of the Cape to Cairo and the Lobito Bay-Katanga railroads, but it does not indicate the Cape to Cairo telegraph, which has been extended north as far as Ujiji on Lake Tanganyika; nor does it show the automobile freight road, now far advanced between the Congo and the Nile, and it errs in indicating that the projected railroad between Stanleyville and Albert Nyanza is in course of construction, for nothing has been done later than the rough survey made years ago. The name "British Central Africa Protectorate" disappears from this map and the name "Nyasaland Protectorate" is spread over all the British territory contiguous to Lake Nyasa.

AMERICA.

U. S. HYDROGRAPHIC OFFICE CHARTS.

Pilot Chart of the North Atlantic Ocean, December, 1907.

Pilot Chart of the North Pacific Ocean, January, 1908.

UNITED STATES.—Map of the State of Oklahoma. Scale, 1:1,000,000 or 15.78 statute miles to an inch. In *Bulletin* 89 of the Census Bureau, entitled "Population of Oklahoma and Indian Territory." Washington, D. C., 1907.

A commonplace map with only the roughest delineation of surface forms, but showing in colours the counties of the new State, the boundaries of Congressional Districts, the railroads and settlements. Index letters and figures on the margins refer to a list of the geographical names in the State, printed on the back of the map.

UNITED STATES.—Soil Map of Grainger County, Tenn. Scale, 1:63,360 or one statute mile to an inch. Department of Agriculture (Bureau of Soils), Washington, D. C., 1906.

UNITED STATES.—Geologic and Structural Map of the Summerland Oil District, Santa Barbara Co., Cal. Scale, 1:62,500 or 0.9 statute mile to an inch. Contour interval, 50 feet. *Bull.* 321, U. S. Geological Survey, Washington, D. C., 1907.

Illustrates Mr. Ralph Arnold's report on the geology and oil resources of this district. The geology has been imposed by Mr. Arnold upon the Government topographic sheet.

UNITED STATES.—Map of the Panama Canal (Plan of the 85-foot Level). Scale, nearly five statute miles to an inch. In "Panama. The Isthmus and the Canal." By C. H. Forbes-Lindsay. The John C. Winston Co., Philadelphia, 1906.

A satisfactory plan of the canal project that is to be carried out. Each mile is marked along the route, starting from the north side of Limon Bay and extending over four miles out into the Bay of Panama, a total distance of nearly fifty miles.

ASIA.

The following maps of parts of China produced by the Topographical Section, General Staff, War Office, London, have been presented to the Society by Major C. F. Close, R.E.

CHINA.—Map of Yünnan. Scale, 1:1,267,200 or 20 statute miles to an inch. Compiled by Major H. R. Davies, 1906. (Price, 3s. 6d.)

CHINA.—Province of Shan-tung. Scale, 1:1,000,000 or 15.78 statute miles to an inch. 1905. (Price, 2s. 6d.)

CHINA.—Province of Chê-Chiang (Provisional Issue). Scale, 1:1,000,000 or 15.78 statute miles to an inch. 1906. (Price, 2s.)

CHINA.—Province of Ho-nân. Scale, 1:1,000,000 or 15.78 statute miles to an inch. 1906. (Price, 2s. 6d.)

CHINA.—Province of Ssü-ch'uan. Eastern Sheet. (Provisional issue without hills.) Scale, 1:1,000,000 or 15.78 statute miles to an inch. London, 1905. (Price, 2s. 6d.)

These are useful maps compiled from the most reliable map sketches and surveys up to the present time. A list of all authorities used is given on each sheet, and some of the lists, especially that relating to Yunnan, show that there has been remarkable progress in the more detailed exploration of parts of China in the past thirty years. The maps are clearly executed and printed in colours.

PERSIA AND AFGHANISTAN.—Persia and Afghanistan. Scale, 1:4,055,040 or 64 statute miles to an inch. Topographical Section, General Staff, War Office, London, 1906. (Price, 2s. 6d.)

An orographical and route map of these countries and Baluchistan, showing the approximate elevations of the land from sea level to over 20,000 feet above it by white and nine deepening shades of brown. The railroads and routes are in red and symbols show the gauges of railroads and the lines that are under construction or only projected. Wells, springs and rivers are marked, telegraphs and mountain passes are indicated and many heights are shown in feet.

PHILIPPINES.—Reconnaissance Map of Benguet Mineral Regions. Scale, 1:24,000 or 2,000 feet to an inch. Contour interval, 100 feet. The *Philippine Journal of Science*, Vol. 2, No. 4, Manila, 1907.

Benguet is in northern Luzon. The region and its inhabitants have aroused much interest, and the occurrence of gold there, apparently in considerable quantity, has increased the desire for more knowledge of this part of the island. It is now ranked among the most promising mining regions of the Philippines. This map gives the results of a general geologic reconnaissance of a part of this region.

EUROPE.

AUSTRIA-HUNGARY.—Geologische Karte des Kaisergebirges. Ausgenommen und ausgearbeitet von Dr. Kurt Leuchs. Scale, 1:33,000 or 0.52 statute mile to an inch. *Zeitschrift des Ferdinandeums für Tirol und Vorarlberg*, No. 151. Innsbruck, 1907.

Dr. Leuchs made the geological studies for this map during eight months of 1904 and 1905. He has imposed his geological data upon the topographical basis of the special map of the German and Austrian Alpine Union. Fifteen tints are used to show the distribution of the geological formations without obscuring the contours of elevation or other natural and cultural features. Hachuring is used for the peaks, and the surrounding regions for a number of miles are shown in their geological, topographical and cultural aspects. The map is thus a fine delineation of this range in the eastern Alps and its immediate environment.

LUXEMBURG.—Carte Topographique du Grand-Duché de Luxembourg. Scale, 1:50,000 or 0.7 statute mile to an inch. By J. Hansen. 15 sheets. Published in Paris from 1904 to 1907. Sold in Paris by J. Hansen, Rue La Romiguière 4. (Price, 36 shillings.)

Between 1883 and 1906, Mr. Jules Hansen, cartographer of the Paris Geographical Society, devoted several months of each year to the production of his original map. It was based upon the Grand Duchy's cadastral survey and other exact material, including engineering surveys and an important amount of hitherto unused data, all of which was utilized, on a scale of 1:20,000, in Hansen's map picture of Luxemburg. The compiler also visited every part of the Grand Duchy to obtain, through his own observation, material for the correction and enrichment of his data. The map was finally published under the patronage of the Grand Ducal Government on a scale of 1:50,000. It has the distinction of giving the first detailed view of the topography and cultural features of the region.

The whole work is carefully done and presents an enormous amount of information. Highways crossing the railroads, for example, are distinguished, at the tracks, according as they cross at grade or above or below grade. The streams where water power is utilized are distinguished from others. The finest points of view for outlooks over the country are indicated. Facts equally minute are given in all classes of information.

The topographical forms are shown by contours, but this is the one feature that is not entirely satisfactory, because the contour intervals are not equal. The reader may easily distinguish the steeper from the gentler slopes, but he cannot determine the degree of slope. For this reason the picture of relief forms is not so well generalized as on most of the detailed topographic maps. Nevertheless, the map is one of great usefulness and is worthy of special note as an arduous work of compilation and original investigation, brought to a successful conclusion by the long, patient and painstaking labours of one man.

WORLD.

WORLD.—Tektonische und Seismologische Übersichtskarte der Erde. Mercator's Projection. Von Prof. Dr. Fritz Frech. (1) Gebirge und Meerestiefen der Erde; (2) Die Verbreitung der Erd- und Seebeben. *Pet. Mitt.* (Justus Perthes, Gotha), Nov., 1907.

Illustrates Dr. Frech's paper on "Erdbeben und Gebirgsbau," showing in colours (1) the distribution of the various types of surface features as produced by tectonic agencies and (2) the distribution of earth- and sea- quakes.

ATLASES.

ATLAS UNIVERSEL DE GÉOGRAPHIE.—Ouvrage commencé par M. Vivien de Saint-Martin et continué par Fr. Schrader. No. 68, Afrique Australe. Librairie Hachette & Co., Paris, 1907. (Price, 1 fr. a sheet.)

Only two more of the twelve African sheets are yet to be published. This sheet includes nearly all of the British South African possessions, the larger part of Portuguese East Africa and the eastern regions of Angola and German South West Africa. A leaflet enumerates the cartographic bases of the map, and as the mother maps are constantly improving, it is not surprising that this sheet of South Africa is one of the finest yet produced. The clear delineation of the Witwatersrand is interesting not only because this ridge is the greatest gold mining centre of the world, but also because it forms a conspicuous water parting.

ACCESSIONS TO THE LIBRARY.

OCTOBER-DECEMBER, 1907.

AFRICA.

BAEDEKER, KARL.—Egypt and the Sudan. Hand-book for Travellers. 24 Maps, 76 Plans and 57 Vignettes. 6th remodelled edition. Leipzig, K. Baedeker, 1908, 16mo.

EGYPT EXPLORATION FUND.—Twenty-eighth Memoir: The XIth Dynasty Temple at Deir El-Bahari, Part I. By Edouard Naville. With chapters by H. R. Hall and E. R. Ayrton. (31 Plates.) London, Egypt Ex. Fund, 1907, 4to.

FUCHS, V.—Ein Siedelungsvorschlag für Deutsch-Südwestafrika. [Sketch map.] Berlin, Dietrich Reimer (Ernst Vohsen), 1907. 8vo.

GAYET, ALBERT.—La Civilisation Pharaonique. Paris, Plon-Nourrit et Cie, 1907. 16mo.

HATTERSLEY, C. W.—Uganda by Pen and Camera. With a Preface by T. F. Victor Buxton. Illustrated. Philadelphia, The Union Press [American Sunday-School Union]; 1907. 8vo. [Gift.]

MASPERO, G.—Causeries d'Égypte. Paris, E. Guilmoto, (1907). 8vo.

MICHELL, HON. SIR LEWIS.—The Cape to Cairo Railway. With Sketch Map, pp. 98-105 *Journal of the Society of Arts*, Vol. 55, 1906. London, Pub. for the Society. 8vo. [Gift from the Author.]

SCHILLINGS, C. G.—In Wildest Africa. Translated by Frederic White. With over 300 photographic Studies direct from the Author's negatives, taken by day and night; and other illustrations. New York and London, Harper & Brothers, 1907. 8vo. [Gift.]

AMERICA.

BARBOUR, JAMES SAMUEL.—A History of William Paterson and the Darien Company. With illustrations and appendices. Edinburgh and London, Wm. Blackwood and Sons, 1907. 8vo.

BISHOP, IRVING P.—The Red Book of Niagara. A comprehensive Guide to the Scientific, Historical and Scenic Aspects of Niagara. For the use of Travellers. Illustrations, Index and Maps. Buffalo, N. Y., C. A. Wenborne, 1907. pr., 8vo.

BUZZACOTT, FRANCIS H.—Complete American and Canadian Sportsman's Encyclopedia of Valuable Instruction. Revised Edition, 1905. [Illustrated.] Published by The American and Canadian Sportsman's Association. (Chicago, 1906.) 16mo. [Gift from the Author.]

CONNECTICUT. ROAD BOOK of the Connecticut Division, League of American Wheelmen, 1896. [With Index Map, and Sectional Map in 27 Parts.] New York, J. B. Beers & Co., 1896. Folding, pocket 8vo. [Gift from John B. Uhle, New York.]

CRAIG, NEVILLE B.—Recollections of an Ill-Fated Expedition to the Headwaters of the Madeira River in Brazil. By In coöperation with the members of the Madeira and Mamoré Association of Philadelphia. (Illustrations and Maps.) Philadelphia and London, J. B. Lippincott Co., 1907. 8vo.

DAVIS, J. E.—Round About Jamestown. Historical Sketches of the Lower Virginia Peninsula. [Map] and (Illustrations). (Hampton, Va., 1907.) 16mo. [Gift from the Author.]

DIENER, MIETZE.—Reise in das Moderne Mexico. Erinnerungen an den X. Internationalen Geologen-Kongress in Mexico. Illustrationen und Karte. Wien und Leipzig. A. Hartleben, 1908. pr. 8vo.

ENOCK, C. REGINALD.—The Andes and the Amazon. Life and Travel in Peru. Map, four coloured plates and fifty-eight other illustrations. New York (Imported by), Charles Scribner's Sons, 1907. 8vo.

FISHER, SYDNEY GEORGE.—Pennsylvania: Colony and Commonwealth. [Maps.] Philadelphia, Henry T. Coates and Co., 1897. 8vo.

FORBES-LINDSAY, C. H.—Panama. The Isthmus and the Canal. Illustrated. Philadelphia, The John C. Winston Co., 1906. 8vo.

GAZETTEER, LOVELL'S, of British North America. Edited by P. A. Crossby. [With Map.] Montreal, John Lovell & Son, 1881. 8vo. [Gift from Thomas Letts, New York.]

GLASS, FREDERICK C.—"Through the Heart of Brazil." A Diary of Incident and Adventure, during a Gospel Expedition of about 5,000 miles in and around Brazil, with some information about the Interior Indian Tribes. [Illustrations.] Liverpool, South American Evangelical Mission. [1905?] 8vo. [Gift.]

HALDEMAN, S. S.—Pennsylvania Dutch: A Dialect of South German with an infusion of English. London, Trübner & Co., 1872. 8vo.

HARPER, ROLAND M.—Georgia's Forest Resources. (To be continued.) In "Southern Woodlands," *A Journal of Forestry, etc., published by The Georgia Forest Association. Vol. I, No. 3, Aug. 1907. (Map.)* [Gift from the Author.]

HARPER, ROLAND M.—A Midsummer Journey through the Coastal Plain of the Carolinas and Virginia. [From the *Bulletin of the Torrey Botanical Club*, 34 pp. 351-377.] [New York], 1907. pr., 8vo. [Gift from the Author.]

HASE, IRWIN VON.—In der Pampa, Argentinische Skizzen. [Portrait.] Berlin, C. A. Schwetschke u. Sohn, 1906. 16mo.

HOLMAN, FREDERICK V.—Dr. John McLoughlin, the Father of Oregon. With Portraits. Cleveland, The Arthur H. Clark Co., 1907. 8vo.

HUMBOLDT, ALEXANDRE DE.—Volcans des Cordillères de Quito et du Mexique. 12 Planches.) Paris, Gide et J. Baudry, 1854. Long 4to.

JAHN, ALFREDO, JR.—Contribuciones á la Geografía Física de Venezuela: I, Observaciones al Plano Militar de la República por Carácas, Tipografía Universal, 1907. p., 18 pp. 8vo. *Extracto del No. 2, Tomo VIII de los "Anales de la Universidad Central de Venezuela."* [Gift from the Author.]

JEFFERSON, MARK.—The Distribution of People in South America. [5 sketch-maps.] Reprinted from the *Bulletin of the Geographical Society of Philadelphia*, July, 1907. pr., 12 pp. 8vo. [Gift from the Author.]

KOCH-GRÜNBERG, THEODOR.—Indianertypen aus dem Amazonasgebiet. Nach eigenen Aufnahmen während seiner Reise in Brasilien, von II.: Tuyuka, Bara. [41 Plates.] Berlin, Ernst Wasmuth, A. G. [1907]. Folio, in sheets. [Gift.]

KOEDEL, W. H.—Modern Argentina. The El Dorado of To-Day. With Notes on Uruguay and Chile. 123 illustrations. London, Francis Griffiths, 1907. 8vo.

LEONARD'S NARRATIVE.—Adventures of Zenas Leonard, Fur Trader and Trapper, 1831-1836. Reprinted from the rare original of 1839. Edited by W. F. Wagner, M.D. With maps and illustrations. Cleveland, The Burrows Brothers Co., 1904. 8vo.

LEWIS AND CLARK EXPEDITION, ORIGINAL JOURNALS OF THE, 1804-1806.—Printed from the original MSS. . . . Together with manuscript material . . . from other sources. . . . Now for the first time published in full and exactly as written. Edited, with Introduction, Notes and Index, by Reuben Gold Thwaites. (Maps and Illustrations.) New York, Dodd, Mead & Co. 1904-1905. 7 vols. and Atlas. 8vo. [*Gift.*]

MERZ, ALFRED.—Beiträge zur Klimatologie und Hydrographie Mittelamerikas. [Map, etc.] Leipzig, C. G. Naumann. (1907.) pr., 8vo. [*Gift from the Author.*]

NEW HAVEN, City Guide to. Being a pocket directory for Citizens and Strangers. By J. W. Barber and L. S. Punderson. [With map and folding plan.] New Haven, Barber & Punderson. 1860. 36 pp. 12mo. [*Gift from John B. Uhle, New York.*]

NEW YORK STATE, Road Book, N. Y. Division, League of American Wheelmen. 1892. [With seven route maps, on one sheet, folded in pocket.] [New York, L. Am. W.] 170 pp. long 12mo. [*Gift from John B. Uhle, New York.*]

PARRISH, RANDALL.—The Great Plains. The Romance of Western American Exploration, Warfare and Settlement, 1527-1870. (Illustrations.) Chicago, A. C. McClurg & Co. 1907. 8vo. [*Gift.*]

PELLESCHI, GIOVANNI.—Eight Months on the Gran Chaco of the Argentine Republic. London, Sampson Low, Marston, Searle and Rivington. 1886. 16mo.

PORTER, EDWARD D.—Rambles in Old Boston, New England. (Map, etc.) Boston, Cupples, Upham and Co. 1887. 8vo.

SAVILLE, MARSHALL H.—Contributions to South American Archeology. The George G. Heye Expedition. The Antiquities of Manabi, Ecuador: A Preliminary Report. (55 Plates, 9 Figures.) New York. (Irving Press.) 1907. [*Gift from Marshall H. Saville and George G. Heye.*]

VALLENTIN, WILHELM.—Paraguay: Das Land der Guaranis. Mit 38 Illustrationen. Berlin, Hermann Paetel. 1907. 8vo.

WEBBER, LIEUT.-COL.—The Essequibo and Potaro Rivers, with an account of a visit to the recently discovered Kaieteur Falls. With map and frontispiece, and descriptive notes on the geology of Guiana. London, Edward Stanford. 1873. 16mo.

WINTER, NEVIN O.—Mexico and Her People of To-Day. Illustrated from original photographs by the Author and C. R. Birt. (2 maps.) Boston, L. C. Page and Co. 1907. 8vo.

WOLLENWEBER, L. A.—Gemälde aus dem Pennsylvanischen Volksleben. Schilderungen und Aufsätze, u. s. w. Cyklus I. Philadelphia und Leipzig, Schäfer und Koradi. 1869. 12mo.

ASIA.

GRANT, ELIHU.—The Peasantry of Palestine. The Life, Manners and Customs of the Village. Illustrated with Original Photographs. Boston, The Pilgrim Press. (1907) 8vo.

GRIFFIS, WILLIAM ELLIOT.—The Japanese Nation in Evolution: Steps in the Progress of a Great People. (Illustrations.) New York, T. Y. Crowell & Co. (1907) 8vo. [*Gift.*]

HUNTINGTON, ELLSWORTH.—The Pulse of Asia. A Journey in Central Asia illustrating the Geographic Basis of History. Illustrated. (Map.) Boston and New York, Houghton, Mifflin & Co. 1907. 8vo. [*Gift from the Author.*]

[LIPSKI, V. I.—Mountainous Bokhara. Results of three years' Journey in Central Asia in 1896, 1897, and 1899. Part I: Gissar Expedition, 1896; Part II: Gissar-Peter the Great Ridge. Alai. 1897; Part III: Ridge of Gissar and Eastern Bokhara. Ridge of Darvaz. Mazar and Peter the Great. 1899. Maps and Plates. St. Petersburg, Imperial Russian Geographical Society, 1902-1905. 3 vols. 4to. Russian Text. [*Gift from the Author.*]

RUSSEL, FLORENCE KIMBALL.—A Woman's Journey through the Philippines. (Map and Illustrations.) Boston, L. C. Page and Co. 1907. 8vo. [*Gift.*]

WEALE, B. L. PUTNAM.—The Truce in the East and Its Aftermath. Being the sequel to "The Reshaping of the Far East." Illustrations and Maps. New York, The Macmillan Co. 1907. 8vo.

AUSTRALASIA.

PÖCH, RUDOLF.—Einige bemerkenswerte Ethnologika aus Neu-Guinea. Mit 1 Tafel und 8 Abbildungen im Text. [*Separatabdruck aus Band XXXVII (Dritte Folge, Band VII) der Mitteilungen der Anthropologischen Gesellschaft in Wien.*] Wien, 1907. 16 pp. 8vo. [*Gift from the Author.*]

(PÖCH, RUDOLF.)—Reisen in Neu-Guinea in den Jahren 1904-1906. 2 Tafeln, 7 Figuren. Aus der Zeitschrift für Ethnologie, Heft 3, 1907, pp. 382-400. 8vo. [*Gift from the Author.*]

PÖCH, RUDOLF.—Zweiter Bericht über meine phonographischen Aufnahmen in Neu-Guinea (Britisch-Neu-Guinea vom 7. Oktober 1905 bis zum 1. Februar 1906). Mit 1 Tafel und 3 Textfiguren. Aus den Sitzungsberichten der kaiserl. Akademie der Wissenschaften in Wien, Mathem.-naturw. Klasse, Bd. CXVI, Abt. IIa., April, 1907. 17 pp. 8vo. [*Gift from the Author.*]

COLONIES.

LECLERCQ, JULES.—La Domination Anglaise aux Colonies. (*Extrait de la Revue Générale, Octobre 1907.*) Bruxelles, Goemaere. 1907. pr., 8vo, [*Gift from the Author.*]

NEAME, L. E.—The Asiatic Danger in the Colonies. London, George Routledge & Sons. 1907. 16mo.

SHEEL, WILLY.—Deutsche Kolonien. [Plate.] Berlin, C. A. Schwetschke und Sohn. 1907. pr., 8vo.

CARTOGRAPHY.

POLLACCHI, P.—Les Échelles Métriques des Cartes géographiques, topographiques et marines et Règle graduée supprimant les calculs de ces échelles. Paris, R. Chapelot et Cie. 1907. 32 pp. 8vo. [With Règle graduée.] [*Gift from the Author.*]

POLLACCHI, P.—Lecture des Cartes Russes. Indications linguistiques, géographiques et topographiques. Paris, R. Chapelot et Cie. 1907. sq. 8vo. [*Gift from the Author.*]

Pollacchi, P., Règle graduée supprimant les calculs des échelles métriques du capitaine —. Par M. Rolip. [Article, pp. 51-53, with 3 figures, in "La Nature," 35^e Année, No. 1778, 22 juin, 1907.] [*Gift from Capt. P. Pollacchi.*]

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SCHIAPARELLI, CELESTINO.—Ibn Gúbayr. (Ibn Giobeir.) Viaggio in Ispagna, Sicilia, Siria e Palestina, Mesopotamia, Arabia, Egitto compiuto nel Secolo XII. Prima Traduzione fatta sull'originale Arabo da ———. Roma, Casa Editrice Italiana. 1906. 8vo. [Gift from the Author.]

SCHULTZE, OSKAR.—Das Weib in anthropologischer Betrachtung. Mit 11 Abbildungen. Würzburg, A. Stuber. 1906. pr., 8vo.

SLATER, J. A.—Dictionary of the World's Commercial Products, with French, German and Spanish equivalents for the names of the commercial products. 2nd Edition. London, Sir Isaac Pitman and Sons. [1907.] 8vo.

STEVENSON, PAUL EVE.—The Race for the Emperor's Cup. With Illustrations. New York, The Rudder Publishing Co. 1907. 8vo. [Gift from the Author.]

STIGAND, C. H.—Scouting and Reconnaissance in Savage Countries. (With 3 Star Charts.) London, Hugh Rees. 1907. 16mo.

TEMPLE, RICHARD CARNAC, *Editor*.—The Travels of Peter Mundy, in Europe and Asia, 1608-1667. Vol. I, Travels in Europe, 1608-1628. (Three maps and three illustrations.) Cambridge, Hakluyt Society, Second Series, No. XVII. 1907. 8vo.

THOMPSON, E. M.—*Paleografia Greca e Latina*. Traduzione dall'inglese con aggiunte e note di Giuseppe Fumagalli. 2da edizione . . . Con 30 incisioni nel testo e 6 tavole in fototipia. *Manuali Hoepli*. Milano, Ulrico Hoepli. 1899. 16mo.

WODON, LOUIS.—*Sur quelques Erreurs de Méthode dans l'Étude de l'Homme Primitif. Notes Critiques. Fascicule 4 des Notes et Mémoires, Instituts Solvay*. Bruxelles, Misch et Thron. 1906. 8vo.

BOOK NOTICES.

La Flandre. Étude Géographique de la Plaine Flamande en France, Belgique et Hollande. Par Raoul Blanchard. ix and 530 pp., 48 Photographs, 76 Figures, including maps in Text and 2 Maps in colours. Armand Colin, Paris, 1906. (Price, 12 fr.)

This large octavo, handsomely produced, is a geographical study of the first class. It is especially welcome because no similar study has ever been made of the Plain of Flanders. The task assumed by Dr. Blanchard was to give thorough geographical treatment to a distinct geographical unit extending along the seaward parts of France, Belgium and the Netherlands. He had the moral and substantial support in his laborious undertaking of a number of leading societies and institutions, including the Geographical Society of Lille, the University of that city, and the Dunkerque Society for the Encouragement of Letters, Science and Arts, which bore the expense of printing the book.

The result is a fine volume in which the subject is developed in a logical and orderly manner, illustrated with many characteristic photographs and helpful maps, while the footnotes really form a comprehensive bibliography of the literature relating to Flanders down to the present time. The book opens with a concise account of the name Flanders and its geographical application; the climatic characteristics and their influences are then treated, and a discussion of the geology of the Flemish depression leads naturally to descriptions of the soils and relief forms, and the influence of the drainage upon the topography.

The past and present condition of the coasts, the dunes, the polders and other physical aspects of the maritime regions lead up to chapters on the origin and nature of the ports, the evolution of the towns, the war against the sea and the reclamation of the wastes. The evolution of the interior of Flanders, with its higher lands and forests, its great industries, its cities, and descriptions of the life, manners and distribution of its inhabitants fill a number of chapters, and, finally, the commercial routes and commerce, the excessive density of the population and its consequences, and the necessity for emigration, bring the work to its conclusion.

Treating many sides of the questions before him, incessantly defining cause and describing result, the author's entire work leads to the conclusion so tersely expressed by Michelet: "Flanders was made, so to speak, in spite of nature. It is a work of human labor." This valuable book will give many readers an opportunity to become better acquainted with peculiar features of the geography of parts of three great countries.

Southern Germany (Württemberg and Bavaria). Handbook for Travellers. By Carl Baedeker. xxx and 335 pp., 30 Maps, 23 Plans, and Index. Tenth revised edition. Carl Baedeker, Leipzig, 1907, also Charles Scribner's Sons, New York. (Price, M. 6.)

This edition corresponds with the 29th German edition. Special attention is devoted to the art treasures of Munich and other large cities in south Germany, and an article by the late Prof. Anton Springer on South German art will be very helpful to many travellers. Among the leading cities described are Stuttgart, Tübingen, Nuremberg, Würzburg, and Munich.

British Imperialism and Commercial Supremacy. By M. Victor Bérard, translated by H. W. Foskett. London: Longmans, Green & Co., 1906. pp. x+298.

"Force is no remedy; science is remedy." The disease to be remedied is the decline since 1872 in British industries and commerce; the remedy is not imperialism, protection, or pan-Britannism; but the adoption of rational methods, the abandonment of antiquated, provincial ideas, and the acquisition of a spirit of willingness to conform to the rapid changes of modern times. This is the gist of a book written in French in 1900 by M. Bérard and translated into English in 1906. The foundation of the book is geographic. The main argument runs as follows: If a line be drawn from Newcastle almost south to Birmingham and thence southwest to Exeter, Great Britain will be divided into two diverse parts. To the southeast lies a gently-rolling, green country where agriculture flourishes. Here the Norman conquerors settled, and the feudal system, with all its class privileges, found a fitting environment. To the northwest lies a mountainous country, black now with factories, but formerly the home of hardy peasants who needs must eke out agriculture with sheep-raising. Here the heterogeneous conquered races of Celt and Gael and others found a refuge. Here life was hard, diversity was the rule, and men learned the habit of independence. Hence, at the beginning of the eighteenth century, there were two Englands. "Green England" was a populous land of plains and agriculture, of lords and peasants, of the cavalier and the Established Church, of privilege and conservatism. "Black England" was a scantily-populated land of mountains and sheep-raising, of poor men whose lords were also poor and hardy, of the Puritan and the sects, of discontent and active thought.

In "Black England" activity of thought led to scientific discovery. Then her people forged ahead, for to them belonged not only the habits of steady work bred of stern conditions of life, but the coal and iron which form the basis of modern manufacturing industry. Great cities,—Newcastle, Leeds, Sheffield, Manchester, Birmingham, Cardiff, Glasgow,—sprang up in the "Black Country," and grimy factories even invaded "Green England." There is no need to trace their history. Bérard shows how the necessity of cheap food for artisans led to the repeal of the Corn-laws and to Free-trade. He sketches the growth of reform, and, ever and anon, calls us back to the underlying geographic causes. Manchester, which he continually eulogizes, is set forth as typical of the highest idealism, the greatest unselfishness, the most praiseworthy readiness to adapt herself to new methods. Her creed is "to work for the greatest good of the greatest number," and she does it because she has found that it is best for her, too. "She cuts her trousers to suit the length of Australian legs, for she has made the discovery that in Oceania the human leg shows a tendency to elongate." She be-

lives in peace because the terrible depression of her industries and the starvation of her people during the cotton-famine of the American rebellion taught her the evils brought by war even to those who have no part in it.

Birmingham, which to Bérard is typical of a large part of industrial England, progressed with Manchester at first. She supplied the methods, Manchester the ideas. Joseph Chamberlain, her great Mayor, was her chief exponent. But, as he changed from a Radical Liberal to a Radical Unionist Tory, so she changed. Foreign competition interfered with her trade. The Germans developed their coal and iron, and dug canals to bring Westphalia as near as Birmingham to water communication. American manufactures suddenly expanded. Instead of adapting herself to new conditions as Manchester did, she cried for a protective tariff, or a commercial union of Anglo-Saxons, or imperialism. She would not change her methods, her styles of manufacture, her conceited way of thinking that English methods and the English language must be adopted by all the world. The blight of "Green England" had fallen on "Black England." The equable climate and outdoor life of centuries had made the people of "Green England" believe that "force of muscle and fear of God are the chief objects of education." "Hardly ever has scientific method and patient research been the mainspring which has kept in motion any continuous effort." And, worse than this, the conservative, agricultural life of "Green England" has made the country "peer-ridden." The universal aspiration is to be "select" and "distinguished,"—"to live like a lord." It is this, more than all other causes combined, which has caused England to fall behind in the industrial race. She undeniably has done so in spite of her great advantage at the start, as Bérard shows by abundant figures. If she would recover her position she must overcome the effects of long-continued environment, although "it is questionable whether the temperament and prejudices of the nation can ever adapt themselves to modern requirements."

Many readers will think that Bérard overstates the case. This, at least, can be said: he is no harder on England than on his own France. Occasionally he makes amusingly unreasonable statements. For instance, he speaks of the "never-failing honesty and fidelity" of Armenians who, by their emigration from Turkey, "supply the one element still wanting to ensure the success of the American spinning and weaving industries." The style of the book is easy and pleasant. Some readers may object to the way in which Bérard leads one on through a long and apparently convincing discussion, and then, without warning, suddenly explodes the whole argument; but that is a matter of taste. The general excellence of the book cannot be questioned. Whether one agrees with all its conclusions or not, no one can read it without being greatly stimulated to thought. To the geographer it is of especial interest, because it everywhere brings movements of commerce, politics, and education into touch with geographic environment.

E. H.

Commercial Raw Materials.—Their Origin, Preparation, and Uses.

By Charles R. Toothaker, Curator of the Philadelphia Museums. xi and 108 pp. Photographs, Product Maps and Index. Ginn & Company, Boston, 1905. (Price, \$1.25.)

The public schools of Pennsylvania receive from the Philadelphia Museums collections of commercial products, maps, and photographs illustrating world commerce and designed to aid the teaching of commercial geography and natural

science. The standard collection comprises 25 maps showing commercial distribution, over 100 economic photographs, and over 300 commercial products. This volume was prepared primarily as a work of reference for the schools in connection with the use of these collections. It will also be very useful in all schools where economic geography is taught. Materials of commerce are briefly described under the classification of vegetable, animal, and mineral substances. The description of materials is excellent, but so condensed that many important data are omitted. Panama straw, for example, defined as "the split leaf of a palm tree" (*Carludovica palmata*) is by no means the only material of which Panama hats are made. The geographic distribution of materials is admirably shown on a large series of Mercator charts, which make clear by shading tints the parts of the world producing the largest amounts of the various articles. This is one of the best supplements to our text-books of commercial geography that have yet been produced, and it will be appreciated in a large number of our educational institutions.

Examining and Grading Grains. By T. Lyttleton Lyon and E. G. Montgomery. vii and 101 pp., Illustrations. Ginn & Company, Boston, 1907. (Price, \$.60.)

This is a systematic laboratory course on field crops and the examining and grading of grains. The exercises are planned to cover about one year of laboratory work of four hours per week. The topics are wheat, corn, oats, barley, hay plants, and seed testing. The authors are professors in the agricultural department of the University of Nebraska.

Unter der Mitternachtssonne durch die Vulkan- und Gletscherwelt Islands. Von Carl Kuchler. 174 pp., numerous Illustrations from Photographs and Map. Abel & Müller, Leipzig, 1906. (Price, M. 4.)

The author, who is known for his translations of Icelandic novels and his writings on the literature of the island, was sent to Iceland by Baedeker in 1905 to procure material for a guide-book. The information he obtained, which was much compressed for a tourist manual, has been used in more extended form in this book. It is the work of an intelligent traveller who saw much, describes in a very readable manner what he saw, and writes with sympathetic interest and with the best wishes for the welfare of the people and their country. Knowing the language of Iceland, he had an advantage over many earlier writers on the island; and though his book adds nothing to our geographical knowledge, its sketches of the land and its people have received the high praise from Dr. Thoroddsen of being trustworthy. Everything that the tourist goes to Iceland to see, including Mount Hekla and its ascent, is graphically pictured with pen and camera. The photographs are excellent and numerous, and the many glimpses they give us of Reykjavik are especially enjoyable. The black-and-white map is produced from Stieler's Hand-Atlas on a slightly larger scale, but with fewer place-names.

East of Suez: Ceylon, India, China, and Japan. By Frederick C. Penfield. New York: The Century Co., 1907. pp. xvii+349.

In his preface Mr. Penfield announces that he is going to preach a sermon on the things which "he failed to see . . . in that boundless region spoken of as East of Suez." These things are the "products of Uncle Sam's mills, workshops, mines,

and farms," and the Stars and Stripes floating above merchant vessels. Mindful of his text, he devotes one chapter to the history and present importance of the Suez Canal, and to its relation to the Panama Canal. Then, throughout a dozen delightful chapters, he forgets his avowed purpose, and gives us a vivid description of a few places of special interest in India and China. First there is Colombo, the port of that most beautiful of forested islands, Ceylon. Imagine an island where eight hundred million cocoanuts grow yearly! In such a place it is not surprising that the chief popular events should be elephant-driving and pearl-fishing, both conducted by the Government. Pearl-fishing is a huge lottery. It is estimated that there were 83,000,000 oysters available for divers in 1905 on the banks northwest of Ceylon. One oyster in a hundred bears a pearl, and "not more than one pearl in a hundred . . . has a value of importance." When the Government announces that the oysters have grown to suitable size, the town of Marichchikkaddi suddenly springs into being upon a desert strip of sandy seacoast. Within a month or two, palm-leaf huts shelter 40,000 men,—divers, gem-buyers, speculators, money-lenders, petty merchants, coolies. All these lawless adventurers and fanatics, hailing from the whole Asian coast between Aden and Singapore, submit implicitly to a dozen white men. They know that the Britishers are absolutely fair. Ceylon, according to Penfield, is a wonderful country, not only because of its pearls, elephants, and cocoanuts, but because of its clean tea, and its bamboos, which have been measured as growing half an inch in an hour. In lovely Kandy, the ancient capital, which, according to a popular saying, lies "only forty miles from heaven," one sees among the happy people "no squalor, few beggars, and apparently no genuine poverty."

On the main-land of India, Penfield describes Bombay, Jeypore, the Taj Mahal, Benares, and Calcutta. "If any city in the East is sport-mad it is Bombay." Nevertheless, "it is now the largest cotton port in the world next to New Orleans"; and its Parsee merchants furnish an unrivalled example of a race which has preserved energy and commercial ability unimpaired for centuries. Jeypore, the "pink city," is more satisfying than any other town in India. What Penfield tells us is for the most part not new, but it is put in unusually interesting style. One is surprised to learn that the population of India has trebled under British rule.

Farther east we are told that as a port of call, not of origin, Hong Kong has the greatest tonnage of any city in the world. Macao, the old Portuguese city, nearly is a genuine Monte Carlo with twenty fan-tan shops running day and night. Canton, "the commercial capital of China, is the most satisfying, fascinating, and puzzling city in the Orient, if not in the whole world." There, removed from the influence of Peking and of foreigners, "the pulse of the great Flowery Kingdom can best be taken . . . for the native press and native scholars . . . say frankly what they believe." Foreigners are not supposed to be wanted and there is no place for them to stay in this city of 2,000,000 inhabitants. Nevertheless, one sees such signs as "Meals at All Day and Night," or "Steam Laundry & Co."

In two concluding chapters Penfield discusses our new commercial rivals in the Far East,—Germany and Japan. Both are making strenuous efforts to develop Chinese trade. "We are doing nothing. Our rivals are bending every energy to building merchant vessels in order to be able to compete with England. We, again, are resting on our laurels." We are apt to think of Japan as a little country. In truth her population of 47,000,000 is greater than that of

any country in the world except China, India, Russia, Germany, and the United States. Only 16% of her land is arable, and her own products can support only two-thirds of her population. She must of necessity either fall back into lethargy, or develop into a great commercial and industrial power. The conclusions as to the geographic relations of Japan, China, and America are doubtless the most important parts of Penfield's book, but not for them will it be read. Most readers will find the greatest pleasure and profit in the vivid pictures of the happy people of Ceylon, the royal hospitality of the Maharaja of Jeypore, and the "feminine" grace and beauty of the Taj Mahal, tomb of the peerless Queen Arjamand.

E. H.

Uganda by Pen and Camera. By C. W. Hattersley. With a Preface by T. F. Victor Buxton. xviii and 138 pp., and 24 photographic illustrations. Religious Tract Society, London, 1906, and American Sunday School Union, 1816 Chestnut Street, Philadelphia. (Price, 2s.)

The little book describes many phases of life in Uganda. Both letterpress and pictures give a good idea of the really remarkable progress that has been made in our way of civilization. Only thirty-two years have elapsed since Stanley visited that country, but the changes since then have been so numerous and rapid that descriptions of Uganda, written a few years ago, do not well apply to the present time. Such a book as Mr. Hattersley has written is therefore useful.

In his opinion: "The intelligence of the Baganda is quite equal to that of Englishmen; it is only a question of training. They learn to write in an incredibly short time and they stick at and master arithmetic in a way that many Englishmen would be pleased to copy." The average daily attendance at the boys' school in Mengo is 450. Speaking of Bible study, the author says:

If a teacher goes unprepared to a class in Uganda he will probably regret it before he is through his lesson, for the natives do not believe in passing over a passage because it is difficult.

There are scattered throughout Uganda over 1,100 churches, all connected with the Church Missionary Society. In these churches 52,000 worshippers assemble every Sunday, and probably half that number, day by day, come for reading and instruction. The author says nothing of the large work which Roman Catholic missionaries are carrying on.

Peasant Life in the Holy Land. By C. T. Wilson. London: John Murray, 1906. 8vo. p. x, 321.

In spite of the multitude of books upon Palestine there is room for more. Mr. Wilson has chosen as his subject the life of the peasants or Fellahin of the country as distinguished from the people of the cities, on the one hand, and the wandering Bedouin, on the other. He sticks consistently to his subject, and gives a vivid picture of peasant life as it exists to-day, and as it has probably existed since the times of the Bible so far as essential features are concerned. As a missionary who has lived long in Palestine, who has associated intimately with the people, and who speaks their language fluently, Mr. Wilson is peculiarly well fitted for his task. And his book is eminently timely, as the conditions of life in Palestine are beginning to change rapidly.

Most of the changes now in progress appear to be due to the Turkish Government or to the influence of European trade and travel. Formerly most of the land was held in common by all the householders of a village. Now the

Turkish system of laws and taxation has caused most of it to be divided among individual owners. In one case where commercial ownership still exists, Wilson was present at the annual division of land, one fall before the ploughing season began. When the number of prospective cultivators was known, the land was divided into a corresponding number of lots of equal value as nearly as might be. Each man then stuck a leaf into a large lump of clay, after which another man, belonging to the village, but not meaning to cultivate any land that year, was called in. He pulled out the leaves one by one, saying: "To the owner of this leaf I give such-and-such a piece of land." The Turkish system of taxation requires the payment of ready money. As cash is scarce, trade being largely by barter among the peasants, and as the Fellahin are improvident, the tax-payers have recourse to money-lenders in the cities. These usurers charge 20, 25, or even 30 per cent. per annum on large transactions with good security and up to 100 per cent. on small ones. Naturally, the peasants are often unable to pay their debts under such onerous conditions, and the land is fast passing into the hands of money-lenders.

Among the changes due to contact with Europe may be mentioned the dying out of old home-industries such as weaving, by reason of the introduction of foreign manufactures. In the matter of transportation the railroad and wheeled vehicles are supplanting the camel and donkey. New standards of comfort are being introduced by tourists, although the means of living up to them are diminishing. For instance, the supply of wood for fuel, always small, has of late been greatly reduced, steam flour-mills are the greatest transgressors upon the scanty forests, for a single mill soon consumes all the available wood for miles. It might be expected that the influx of foreign travellers would add to the prosperity of Palestine. Wilson thinks that it does not; or, at least, that in spite of it the peasants are steadily growing poorer under the oppression of Turkey and the paralysis of industry occasioned by recurring drought or other natural disasters.

In the first two chapters of his book Wilson discusses religion. He seems to think that aside from outward forms there is little difference between the Mohammedans and the nominal Christian of the Greek Church. The next subject is village and domestic life,—six chapters. The building of the common domed houses of mud and of the universal cisterns is discussed; and then trade, family life from birth to death, dress, diseases, and home industries are considered. The next four chapters, 9 to 12, take up the fundamental industries. Palestine has no universal resources and no advantages for commerce. The sole wealth lies in the soil, which can be utilized directly by means of agriculture or indirectly by stock-raising. The processes of agriculture are well described from the time of the sowing of wheat and barley during the "former" rains in November, through the "latter" rains in the spring and the five or six months of drought in summer to the harvesting of the grapes and olives in the fall. A vivid picture is likewise given of the exposed and wandering life which the shepherd must lead even though he have a permanent home.

E. H.

How to Study Geology. By Ernest Evans. viii and 272 pp., 112 Illustrations, 82 Experiments, and Index. Swan Sonnenschein & Co., London, 1907.

An excellent book for beginners. It forms a course of instruction in elementary geology, and is meant also as a guide to the study of the subject in the field. It embraces all the work required of the student for Stage I of the

British Board of Education Syllabus, and will be helpful, furthermore, to men and women who have no leisure to follow the technical descriptions given in survey monographs and ordinary text-books, but who would like to know more of the past history of the earth and have some guidance in field observation.

The book is commended by some of its special features, such as the simple experiments that are given throughout, the bold-face headlines in connection with the practical work explaining what principles each illustrates, and the systematic arrangement of the stratigraphical portion. Series of questions are given at the ends of chapters. This is one of the best of the elementary text-books, and it has special claims upon the attention of those who do not enjoy the advantage of a teacher in acquiring some knowledge of geology.

Statistical Abstract of the World. By Henry Gannett. viii and 84 pp., Index. John Wiley & Sons, New York, 1907. (Price, 75 cents.)

This little volume is filled with tables of statistics relating to the different peoples of the earth, products of the soil, mines, and fisheries, their manufactures, means of transportation, commerce, and social conditions. The tables are methodically arranged, the figures are the latest obtainable, and the fact that Mr. Gannett compiled the information inspires confidence in its accuracy. A copious index makes it easy to refer to any desired table.

Mr. Gannett says in his preface: "Statistics of the most recent single year are given in preference to the mean of several years as being, on the whole, nearest the truth." It is doubtful if this view is shared by many statisticians. It is well enough in this book, which aims to give only the latest information. In a larger work it would certainly be desirable to give an idea of average and comparative conditions, and this could best be attained by showing the means of several series of years. As a volume for handy reference this statistical abstract will serve a very useful purpose.

Regierung und Nutzbarmachung der Samoanischen Inseln. Von Hermann Fiedler. 12 pp. Wilhelm Süsserott, Berlin, 1906.

This is a plain, business-like discussion, chiefly of the economic conditions of the German colony, from which the author draws conclusions that seem reasonable. The United States harbour of Pago Pago is better than that of the German port Apia; but in very stormy weather steamers will not risk accident at the entrance to Pago Pago, and so carry the Samoan mails to Auckland. The sea journey between Pago Pago and Apia occupies ten hours. The commercial communications between the islands of the group are unsatisfactory, and fares and freights are too high. The author says that the interests of the German colony demand the establishment of German steamship connections, with a Government subsidy and the admission, duty free, of articles of necessity.

Samoa is connected with the outer world by one American and one New Zealand line, with irregular visits from a few other Australian, American, German, and Norwegian vessels. America and New Zealand supply most of the imported necessities of life. Most of the exported island products are sent to these two countries. The American line calls at Pago Pago, and not at Apia.

The prestige of the whites is not enhanced by the fact that the natives of the German islands regard themselves as subject to the Government of Mataapa, though they are living under the protection of Germany.

The Missions of California and The Old Southwest. By Jesse S. Hildrup. ix and 100 pp., 35 Illustrations from Photographs. A. C. McClurg & Co., Chicago, 1907.

This is the story, briefly told, of the old missions in California and the western wilderness, where the Catholic fathers gave their pure and unselfish labours to the amelioration of the moral and social condition of the Indians. The missions had their round of struggle, triumph and decline, and, as the author says, "millions of men have both rejoiced and mourned over the bright career of the fathers and its fateful ending." The author writes of the old padres, the humane work they advanced so far and the rich properties which they created through toil, privation, and danger.

It was in 1833 that the Mexican Government passed the order of confiscation. The religion and morals of the missions were swept away, the Indian neophytes fled to the mountains and their short-lived civilization disappeared forever. The Mission buildings are still the monuments of the work. Some of them are little more than heaps of ruins, while others are in an admirable state of preservation. Many large photographs show the great buildings or the heaps of ruins.

America's Insular Possessions. By C. H. Forbes-Lindsay. Two volumes. vi and 551 pp., and ix and 566 pp., many Illustrations, and Indices. The John C. Winston Co., Philadelphia, 1906.

A successful compilation of facts relating to our insular possessions which should be at the command of all intelligent citizens. The work is well done, and may be commended with confidence as a compendium of accurate information presented in a readable style—an authoritative, popular book on the subject. The author has made careful use of the best data, and the facts are interestingly set forth.

Ample space is assigned to each possession for adequate though concise treatment of it. The introductory chapter gives an historical account of Cuba, Porto Rico, Haiti, and Jamaica which is justified by our intimate relations with the alien islands of the Greater Antilles and their historical and commercial connection with Porto Rico. Porto Rico has 118 pages, Guam 78, Hawaii 99, and the Isthmus of Panama and Canal Project 214. The entire second volume is given to the Philippines. The geographical treatment is accurate, but would have been more scientific if based upon the geology of the islands. This might have been done without impairing the readability of the text. The book should have been supplied with good maps. A work dealing so largely with geography should not compel its readers to go outside for essential map material. The only maps are one of the Panama canal and a poor little sketch of Guam which does not indicate some of the important geographical names in the text. Of the five towns mentioned as the termini of the few good roads the position of two is not shown. The photographs are excellent.

Notes upon the Island of Dominica. By Symington Grieve. 126 pp., 17 Illustrations, Map, Appendix and Index. Adam & Charles Black, London, 1906. (Price, 2s. 6d.)

This little island seems to be one of the least hackneyed and familiar bits of land in the West Indies. The author went there, last year, to study its flora and fauna. He found that the interior of Dominica, which is only about

30 miles long and 16 miles wide, is almost unknown, for it is covered with dense forest. To the surprise of the officials, the explorer and his party cut their way across the island with the aid of machetes, and really saw much of the country.

The map in the book has been brought down to date as far as possible, but Mr. Grieve says it is quite unreliable in many of its details. And no wonder; for it is based upon Byre's map, which was published in 1776! The revised map gives, however, a fair idea of the roads and the position of the new plantations. The author treats at length of the present condition of the island, the cost of bringing the crown lands into cultivation, etc. He describes the volcanic phenomena, the boiling springs, and other wonders of nature, and says that if hotels were built, paths cut, and other conveniences provided, Dominica ought to attract many tourists.

La Route du Simplon. Par Frédéric Barbey. Illustrations de Fred. Boissonnas. Édité par "Atar," S. A., Genève, 1906. 4to.

The preface to this beautiful book opens with an apology. "A whole book consecrated to the history of a road?—This is exaggerated, some will say. But when that road is called the Simplon, when the man who conceived the idea of it is found to have been Napoleon I, when, finally, by a curious coincidence, a hundred years have elapsed from the day the first coaches crossed the mountain at a rapid gait to the day when, from Brieg to Iselle, through the tunnel laboriously constructed, the whistle of the first locomotives was heard, it would have been deplorable had the past and the existence of those pioneers, zealous and active servants of an imperious master, not been recalled to memory."—And, well may we add, it would have been a great pity if the present book, so interesting, so valuable and beautiful, had not been written.

It is a great pleasure to read such plain and yet admirable French. Terse, clear, and devoid of superfluous ecstasy to which Alpine landscape so easily tempts. Truly, the splendid illustrations with which Mr. Boissonnas has adorned the text render many descriptions unnecessary. And, besides, the Simplon is comparatively mild in natural grandeur. Situated almost midway between the stupendous wildness of the Grimsel and the cleft through which one penetrates to the backbone of the Valaisan Alps, entering at Visp and halting at Zermatt, surrounded by the sharply individualized summits of Monte Rosa, the Matterhorn, the Weisshorn and the Mischabel group, the Simplon pass shrinks to second rank in impressiveness, notwithstanding the mass of the Fletschhorn and Monte Leone. There is little occasion for enthusiasm except on the Italian side, where the sinister gorge of Gondo, the lovely vale of Domo d'Ossola and the shores of Lago Maggiore offer particular attractions.

The work is preëminently historical, the tale of the development of the Simplon as an Alpine thoroughfare, from the earliest times of Roman expansion. Previous to that epoch no data exist, although there are some who suggest that the "last of the Helvetians," after the awful devastations under Commodus (180-193 A. D.), partly took refuge in the Valais. That the Romans used the Simplon extensively is proved by numerous finds of coins, and the tradition concerning a fortified tower (*Planum castellum*) on the old path from Italy into Switzerland. The Roman trails did not follow the line of the present road. Instead of keeping in the beds of mountain torrents, they rose to slopes exposed

to sunshine, avoiding dark and humid gorges. Travel increased as time advanced. At first the northern barbarians, the Burgundians and Longobards, used the pass for their destructive inroads into Italy; later on, when times became more peaceable, trade pilgrimage caused an almost constant stream of travellers. In the thirteenth century, a hospice under the patronage of Saint John stood on the highest plateau. It was kept specially for the benefit of itinerants who were (as now) exposed, for eight months of the year, to snow-storms and avalanches. The Bishops of Sion were sovereigns of the Valais, and had supervision of its roads, with the right of collecting toll and tithes for their maintenance. Thousands and thousands of pilgrims, peddlers and merchants enjoyed protection and hospitality in the hospices founded at several points along the Simplon route. Rodolph of Hapsburg had invested the Bishop of Sion with the sovereignty of the Valais about 1275. In the same year Pope Gregory crossed the Simplon on his return to Italy from the Council of Lausanne, to die a few weeks later at Arezzo.

History fails to report anything of importance about the Simplon during the fifteenth and sixteenth centuries, except that the improvements were left to decay. But towards the middle of the seventeenth, the noble figure of Caspar de Stockalper de la Tour, Grand Bailiff of the Valais, appears in relief. The palace of this remarkable man still stands as one of the public buildings of Brieg and testifies to his wealth and artistic culture. Under his rule (for he was in fact lord of the country) the Simplon was rehabilitated and improved. Traffic not only recovered, but greatly surpassed its former importance. His administration lasted until 1678, to the vast benefit of the land. Then jealousy set to work; deprived of the salt monopoly he had enjoyed and which laid the foundation of his riches, he was compelled to flee to Italy, his property was sacked and ruined and he died in poverty in 1691, in reward for his public spirit and generosity.

The close of the eighteenth century was to bring the Simplon to the notice of the world at large. It coincided with the rise into prominence of him who was to become the master of Europe through the empire of the French, or rather, it was a consequence of that rise. A rapid glance at the map of southern Switzerland satisfied General Bonaparte of the importance of the Rhone valley for quick communication between France and Italy, especially for military purposes. Although, in the remarkable campaign of 1800 that culminated in the battle of Marengo (June 14th), Bonaparte selected the Great St. Bernard for passing the Alps with his main force, the Simplon was crossed by a minor detachment operating on his left flank. Already, then, Bonaparte had cast his eye on that pass for a first-class road on which artillery could be moved and when, afterward, the project was definitely set in execution, he constantly insisted that the road should enable the easy transport of artillery. The immediate object of the victor of Marengo was military and political.

He desired to establish the closest relations possible between Paris and the Cisalpine Republic recently founded. He preferred the Simplon to the Great St. Bernard after the practical experience he had acquired about the latter. Therefore, having become first Consul, he issued, Sept. 7th, 1800, a decree, according to which: "the road from Brieg to Domo d'Ossola will be made practicable for cannons" (literally).

The northern section, from Brieg to the divide, was assigned to France, the

southern, from Domo d'Ossola on, was to be made by Italy. The expense of the former devolved upon France, the cost of the latter upon the Cisalpine Republic. But Bonaparte reserved to himself the direction of the whole, and he appointed a French inspector general in the person of Nicolas Céard. A happier choice could not have been made. The work met with grave difficulties, not the least being caused by the climate. On an average, the work could only be carried on during four or five months in the year, enormous snowfalls, accompanied by avalanches, impeding it during winter, fall and part of the spring. Another obstacle was the lukewarmness of the Italians and the opposition of the Canton of Valais, whose people saw in the road a step towards annexation.

The work was, at first, placed under military direction, the technical part excepted, which was left to civil engineers. In October of 1802, the inspector had to report that "nothing or almost nothing" had been done on the side of Italy. It was clear that Italian pride felt hurt at the thought, that their part of the task was in fact controlled by French agents. But in March, 1803, the two sections were definitively separated and from that time the Italians went to work with almost feverish enthusiasm and soon exceeded the French, not only in the amount, but also in the quality, of the work performed. Inspector General Céard, who had captivated from the very beginning, through his particularly tactful behavior, the sympathies of the Italian Government and functionaries, is full of praise for the labour executed on the southern stretch. Finally, in 1805, the road had been so far completed on the whole line that it could be opened to transit. It was, for the time, a gigantic achievement, carried out in twenty-two months of actual field work; not only the road but the tunnels carved out of the rock, where, as at Gondo, the gorge did not allow of an uncovered line, the long galleries constructed for protection from avalanches, the numberless and costly bridges, refuge places and buildings. The total length of the road is 63,619 meters, or nearly forty miles; all in a most difficult country.

At present, when we have become accustomed to look upon no feat of engineering as impossible, when almost no mountain pass opposes insuperable obstacles to railroads, when ascent of gigantic snowy peaks is rendered easy by rail through the heart of the mountain itself, the construction of the Simplon road appears child's play. But we must judge of its merits from the standpoint of the times and their resources.

And it was no small task either, for the authors of the book, to invest it with the thrilling interest it awakens in the reader.

A. F. B.

Pyénées. Par P. Joanne. xlii and 384 pp., 15 Maps, 17 Plans, 6 Views and 8 Panoramas. Librairie Hachette et Cie., Paris, 1905.

This is a new edition of the best known guide to these mountains. The revision was under the direction of Marcel Monmarché with much collaboration, especially of members of the French Alpine Club. The introduction (42 pages) gives a comprehensive view of the Pyrenees as a whole. In speaking of them as extending westward to Cape Toriñana on the Atlantic coast of Spain, the writer merely gives expression to the geological fact that the Pyrenean-Cantabrian system was upheaved by the same tangential thrust into a lofty bordering range on the north of the Iberian peninsula. Usage has authorized the use of the name Pyrenees for the eastern and Cantabrian for the western mountains. As in all the Guides-Joanne, the information relating to hotels, restaurants, tram-

ways, etc., is arranged alphabetically with the name of the localities where they are situated. This information is subject, of course, to frequent change and such arrangement facilitates corrections. The maps, plans, panoramas, and other illustrations are remarkably rich in clearness and amount of information. The numerous watering places among the mountains and the seaside resorts on the Atlantic and Mediterranean coasts are treated with especial fulness. The book covers the region between Barcelona on the south and along the entire mountain district from the Mediterranean to San Sebastian on the Bay of Biscay, with an extension to the Monastery of Montserrat and Barcelona. The guide book is of the highest practical value to tourists in the Pyrenees.

Physische Geographie. Von Dr. Siegmund Günther. 147 pp., 32 Figures, and Index. G. J. Göschen'sche Verlagshandlung, Leipzig, 1905. (Price, 80 pf.)

The third edition of a work that could scarcely be compressed into smaller compass. It covers a very wide field. The eleven sections treat of the form, size, and movements of the earth, its superficial and interior conditions, volcanic and seismic phenomena, terrestrial magnetism, the atmosphere, the sea, inland waters, snow and ice, and the morphology of the earth's crust. This little volume is an excellent example of the "Sammlung Göschen" which includes a large number of brief treatises on scientific subjects by authoritative writers. Volumes so small, of course, cannot be exhaustive, but the books in this collection contain essentials, are not elementary, and are clearly written, well indexed, and useful works.

Höhenklima und Bergwanderungen in ihrer Wirkung auf den Menschen. Von Dr. N. Zuntz, Dr. A. Loewy, Dr. Franz Müller, Dr. W. Caspari. Deutsches Verlagshaus, Bong & Co., Berlin-Leipzig-Wien-Stuttgart-Paris, 1906.

The book contains the results of experimental studies of mountain sickness undertaken on an expedition to the Queen Margherita House in the Eastern Alps by the authors. To obtain most accurate data, two series of observations were made: a preliminary one at Berlin to ascertain the physiological conditions of each member of the party before starting on their trip, and the principal series during the different stages of their sojourn at various heights during the trip itself. The quantities and composition of the food, too, were made uniform for the whole party and based upon physiological principles, so that the changes that were to be noticed during their ascent should be due as certainly as possible to no other influences but elevation.

Only the introductory chapters on the development of the study of mountains and on mountain climates are of a distinctively geographical character; the bulk of the book naturally belongs to physiology and medicine rather than geography. It was found that the symptoms of mountain sickness vary according to the physical constitution of the individual, to the manner in which the ascent is made, and to the rapidity with which it is made. Physical effort causes unpleasant symptoms, and at an earlier stage, than would be observed in a state of rest, and so does a rapid ascent in comparison with a gradual one. Hence walking is more dangerous than riding, and transportation on mountain railroads causes, upon reaching destination, graver attacks than riding on mules or in carriages.

From their own observations on the expedition, as well as in the laboratory, combined with those of earlier workers on the subject, the authors came to the conclusion that the principal cause of mountain sickness must be seen in the lack of oxygen in the higher altitudes. Problems of geographical bearing arise on several occasions during the discussion of the varying adaptability of mountain dwellers to their environment. The suggestion, for instance, that the superstitious awe of the high mountains shown by primitive peoples, and the legends which populate them with evil beings hostile to man, might be traced to the influences of mountain sickness upon primitive intruders, is certainly worth further investigation. Likewise the question, whether the gradual acclimatisation to the change of altitudes experienced by the tourist may be symptomatic of racial adaptations to the same by the permanent inhabitants of the different altitudes, opens up perspectives of interesting study for the ethnologist. The book is splendidly illustrated and an appendix contains the original tables of the observations made by the party. As a compendium of the symptoms, phases, and treatment of the influences of mountain climate on man, the book cannot be surpassed and will be found a never failing source of reference for any one who approaches the subject from the medical, geographical, or tourist point of view.

M. K. G

The Desert and the Sown. By Gertrude Lowthian Bell. With many Illustrations and a Map. E. P. Dutton & Co., New York, 1907.

As a traveller and as a story-teller Miss Bell ranks with Mrs. Isabella Bird Bishop. Both travelled in out-of-the-way places where the inhabitants are prone to be unfriendly, and where none but the bravest of women would dare to go alone; both succeeded to a remarkable degree in winning the confidence of the natives, and in entering into their life and feelings; and both have written narratives of unusual interest. In the present volume Miss Bell relates her experiences in the borderland between Syria and Arabia, a region to which she applies the words of Omar Khayyám:

"the strip of Herbage strown
That just divides the desert from the sown."

Starting from Jerusalem early in February, 1905, she went east across the deep *graben* of the Jordan Valley, and up to the Belka, or Plain of Moab, a land of "swell and fall, fall and swell, as though the desert breathed quietly under the gathering night." Here she crossed the new Mecca railroad which now runs from Aleppo nearly to Medina. Then, turning north, she made her way along the edge of the desert through the Druze country of volcanic Jebel Hauran to Damascus. Thence she zigzagged through the Lebanon by Baalbek and Hamath to Aleppo, and finally west to the sea by way of Antioch, lovely even in its ruins.

The journey lasted only two months. At no time was Miss Bell more than 125 miles from the sea; during half the journey she was within 30 miles of a railroad; and she never was more than 70 miles from steam communication, either by rail or boat. Nevertheless she traversed regions where the people are still absolutely untouched by civilization; and frequently her track led over ground almost unknown to Europeans. The railroad, it must be remembered, is new. Moreover, it lies on the very edge of the almost impenetrable desert. As yet the new means of locomotion has not produced much effect, even upon

the people who live near it. Many of them, indeed, consider it a doubtful blessing because it brings in its train officials and soldiers who commandeer camels and mares wholesale without recompense, and who cannot be disarmed by hospitality as the Arabs can. For a distance of a few miles the railroad brings a certain sense of security from raids from the desert, and it brings opportunities to make a living. Therefore a few Arabs appear to be giving up the nomadic life and settling down to agriculture. The fellahin also are described as extending the area of cultivation, and Circassians from Russia are taking up new land. The entire area of cultivation is very small, however, compared with what it must have been previous to the 5th or 6th century, in the flourishing days of the ruins which continually arouse Miss Bell's enthusiasm. East of the "strip of herbage strown," which lies between the railroad and the Jordan, the great desert is as yet utterly unaffected by modern innovations. Now, as always, a war is in progress, its chief cause being found in some of the raids and blood feuds which Miss Bell vividly describes: "As for the end, there is no end to war in the desert."

Miss Bell does not pretend to write a complete description of eastern and northern Syria. She merely tells what she saw, whether it was a beautiful view in the Lebanon, a plain of black volcanic blocks at the base of the Jebel Druze, or a peasant in picturesque guise. Nor does she often attempt to theorize or draw conclusions. Her chief enthusiasm is for archæology. Some of the ruins which she describes are new discoveries, and most are familiar only to archæologists. The most interesting are those of northern Syria, built in part by the Crusaders, but largely the work of Romanized Syrians during the first five centuries after Christ. The beauty of some of the old churches and country houses leads to one of Miss Bell's few generalizations. Here, she says, we find "the beginning of a new chapter in the architecture of the world. The fine and simple beauty of Romanesque was born in North Syria. It is curious to consider to what developments the genius of these architects might have led if they had not been checked by the Arab invasion. Certain it is that we should have had an independent school of great builders, strongly influenced, perhaps, by classical tradition and yet more strongly by the East, but everywhere asserting an unmistakable personality as bold as it was imaginative and delicate."

The best part of "The Desert and the Sown" is the insight which it gives into the thoughts of the people. Everywhere Miss Bell seems to have won their confidence, whether they were Arab chiefs in goat's hair tents, Druze peasants in houses of black lava, Turkish officials in the palaces of Damascus, or women kept in captivity in old Saracen castles because their beauty would cause quarrels if they were seen abroad. "An oriental city," she says, "will not admit you into the circle of its intimates unless you spend months within its walls, and not even then if you will not take pains to please." Miss Bell evidently took pains to please; and, moreover, she knows Arabic thoroughly, and thereby was able to understand the thoughts of the people in a day, as one who depends on an interpreter cannot in a twelvemonth. Her style of reproducing conversations suggests Doughty's famous 'Arabia Deserta' somewhat, but perhaps it is merely because both she and he have caught and passed on the true tang of the Arabs and the East. However that may be, she gives a most vivid picture of life as it is to-day in Syria,—a picture which is of especial value because of the changes which must follow upon the opening of the railway, the establishment of steam

mills, the influx of tourists, and all that the West pours into the East. In putting away the book one agrees with the servant who said to Miss Bell, "Listen, oh lady, and I will make it clear to you. Men are short of vision and they see but that for which they look. Some look for evil and they find evil; some look for good and it is good that they find, and moreover, some are fortunate, and these find always what they want. Praise be to God! to that number you belong."

E. H.

Larger Types of American Geography. Second Series of Type Studies. By Charles A. McMurry. Pp. 271. New York, The Macmillan Company, 1907.

McMurry's *Larger Types of American Geography* is the third volume in a series devoted to certain selected areas in America. The volume is really a supplementary reader for elementary schools, containing chapters on The Appalachian Mountains, The Rocky Mountains, The Pennsylvania Railroad, The First Pacific Railroad, The Mississippi River, The Iron and Steel Business, Cotton Mills and Cotton Manufacture, and New York City. Each chapter is well illustrated and gives a somewhat detailed account of the general and geographic conditions involved. The author has not restricted himself to the geographic features only, and some of the chapters are not as clearly organized as they might be. The book is, however, a good reference volume for children, and its value would be greatly increased by an index—the lack of which is almost inexcusable in any work in modern times.

R. E. D.

Mathematical Geography. By Willis E. Johnson. 336 pp., 122 figures. American Book Company, 1907.

"The subject-matter of mathematical geography is scattered about in many works, and no one book treats the subject with any degree of thoroughness, or even makes a pretense at doing so. It is with the view of meeting the need for such a volume that this work has been undertaken." With these words the author introduces this most interesting text on "Mathematical Geography," designed for use in the secondary schools and for teachers' preparation. The more practical phases of the subject are treated in a manner well calculated to hold the interest of both student and teacher.

After some introductory paragraphs, the author discusses our conceptions of the earth as a sphere, as an oblate spheroid, and as a geoid, tracing the growth of our knowledge concerning the earth's true shape, and presenting proofs of the correctness of our present ideas. Some practical exercises are introduced to give the student a proper appreciation of directions on the earth, and to make the shape of the earth seem more real to him. Latitude and longitude are defined, and the origin of the terms considered.

The apparent movement of the stars is next explained, and other proofs of the earth's rotation are given. The method of determining latitude from observation of the North star is made clear by figures indicating the necessary corrections. Several paragraphs discuss time in its relation to longitude, circumnavigation and the calendar, emphasizing the practical aspects of these relations by citing instances in which they have had an important bearing on actual problems. Another chapter is devoted to a discussion of the proof and effects of the earth's revolution, and the methods of determining longitude and time.

The seasons are considered at some length, as well as the variations in the

length of day and night, and the cause of twilight. Then follows an explanation of the method for determining latitude from the sun's meridian altitude. The discussion of the tides, chapter IX, is far from creditable. Besides being cumbersome and poorly arranged, it is, as the student will read it, distinctly incorrect. The methods of map projection are elaborately described, with rather too much emphasis on the construction of the projections, and not enough on the essential characters of the resulting maps. The last four chapters present much interesting material relating to our government land surveys, the members of the solar system other than the earth, and the history of mathematical geography.

In the appendix certain matters are further elaborated, including the subject of tides, the further treatment of which is too complicated to be of value to many who will use the book. A glossary of technical terms is placed at the end of the text.

All teachers of Physical Geography will find this book full of interesting material pertinent to that part of their subject dealing with the earth as a globe. In general the explanations are clear, and the subject matter attractively presented.

D. W. J.

A Handbook of Cyprus. Compiled by Sir J. T. Hutchinson and Claude Delaval Cobham. xii and 132 pp., Frontispiece, Two Maps and Index. Edward Stanford, London, 1907. (Price, 2s. 6d.)

The fifth edition of this excellent handbook. With every issue it has been carefully revised and it has attained a high standard of completeness and accuracy. The traveller with geographical or geological leanings will find much to assist and stimulate his studies; if his curiosity tends towards commerce and industry he will find here all leading facts relating to agriculture, fisheries, forests, irrigation works, mineral industries, harbors, and communications. The flora of the island is summarized and there is a list of birds and several pages on wild animals and sport. The principal towns, the antiquities, mythology, and history of Cyprus, together with facts about the population, government, finance, and institutions, are adequately presented. The book ends with an assortment of useful information and hints for tourists. It is the standard guide to this island.

Australasia.—Vol. 1. Australia and New Zealand. By J. W. Gregory. Second edition, rewritten. xxiv and 657 pp., 33 Maps and Diagrams, 80 Illustrations, and Index. Edward Stanford, London, 1907. (Price, 15s.)

This new issue of Australia and New Zealand is in Stanford's Compendium of Geography and Travel. The previous edition was by Dr. A. Russel Wallace and his authorship guaranteed a book of superior merit. During recent years the geographical materials concerning Australia have grown very rapidly and it was felt that a revision of Dr. Wallace's book would not be adequate. Professor Gregory of the University of Glasgow was therefore engaged to write a new work. The responsibility could not have been entrusted to more competent hands. Dr. Gregory is to-day one of the leading authorities on the geography and geology of Australia and that field of labour absorbed him for several years until he was recently recalled to professional duties in Great Britain.

In the present volume the maps have been increased from 14 to 33 and the illustrations from 69 to 80. Some of the maps are superior in execution to those

in the earlier volume, many are in colours, and are the latest cartographic expression of facts relating to Australia and New Zealand. The chart of Australasia, showing the depths of the sea in gradations of blue, illustrates the progress in the past thirteen years of our knowledge of the Pacific sea floor. No map can long keep abreast of this kind of information in the present active days. The recent discovery, for example, of a deep trough along the east side of the Philippines by the German exploring vessel *Planet* was too lately recorded to be available on this chart. It is noteworthy that the sheets of Western Australia contain the very latest mapping of the mining regions supplied by the Geological Survey. Professor Gregory's geological map fills up all the spaces in which the geology was marked *unknown*, in the earlier book. Much of the literature consulted is referred to at the bottom of the pages. We may look upon this volume as a very useful addition to our sources of information relating to the parts of the world of which it treats.

Through Portugal. By **Martin Hume.** xiv and 317 pp., 32 Illustrations in Colour and 8 Reproductions of Photographs. McClure, Phillips & Company, New York, 1907. (Price \$2.00.)

This is an admirable book in its way. There is no more helpful bit of travel literature for those who go to Portugal for sunshine, health or relaxation than Mr. Hume's volume. It is not a guide book, but the author treats Portugal, "the most beautiful country and the most unspoilt and courteous peasantry in Southern Europe," from the point of view of the intelligent visitor, suggests from his own experience routes of travel and points of attraction likely to appeal to such readers and shows them how they may travel most comfortably there and get the most out of a holiday in one of the least hackneyed of European countries. The author went to Portugal prejudiced against the country but he says:

The voyage, of which some of the incidents are here set forth, was for me a continual and unadulterated delight from beginning to end, bringing me refreshment and renewed vigour of soul, mind and body, opening to my eyes, though they had seen much of the world, prospects of beauty unsurpassed in my experience and revealing objects of antiquarian and artistic interest unsuspected by most of those to whom the attractions of the regular round of European travel have grown flat and familiar.

The coloured illustrations and photographs are especially attractive.

Illustrierter Führer durch Dalmatien. (Abbazia-Lussin.) **Längs der Küste von Albanien bis Korfu, und nach den Ionischen Inseln.** (Seventh Edition.) viii and 233 pp., 96 Illustrations from photographs, 14 Coloured Maps and Plans, and Index. A. Hartleben's Verlag, Vienna and Leipzig, 1907. (Price, M. 3.60.)

The present edition of this well known guide-book has been carefully revised and considerably expanded. The Dalmatian coasts and the inland excursions from them offer great variety of scenery and attractiveness. These routes are becoming more and more available to tourists, whose number is increasing. The guide-book covers all information that will attract attention to things most worthy of note. The introduction gives an adequate sketch of the geography and geology, the cultural features, and the history of these regions. Twelve routes from Trieste by land and sea and from the coasts to inland point as, for example, that from Cattaro to Cetinje, the capital of Montenegro, are minutely outlined. The maps and town plans in colours are in the best style of the Hartleben establishment and the vocabulary includes a large number of words in Italian, Servo-Croatian, Slovakian, Turkish, Greek, and the Trieste-Venetian dialect.

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